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THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES

FOR JULY 1863.

ART. I.—*A contribution toward the Natural History of Articular Rheumatism; consisting of a report of thirteen cases treated solely with palliative measures.* By AUSTIN FLINT, M.D., Professor of the Principles and Practice of Medicine in the Bellevue Hospital Medical College, and in the Long Island College Hospital.

THE natural history of a disease comprises everything relating to that disease when its course is not interrupted nor altered by any extrinsic agencies. Under favourable hygienic circumstances, what are the symptomatic events which a particular disease manifests? Of these events, which are constant, which are present more or less frequently, and, as regards the latter, what is the relative frequency of the occurrence of each? What are the laws of the development of the disease, of its progress and of the phenomena which belong to it? What is its intrinsic tendency with respect to its ending in death or recovery? What is its average duration in fatal and non-fatal cases? What appreciable changes in the solids or fluids of the body are peculiar to it? What are its sequels? The answers to these questions embrace the facts which make up the natural history of the disease. The facts are to be obtained by observing cases in which there have been no disturbing influences including therapeutical interference. Cases treated by means of measures designed to arrest, abridge, diminish the intensity of the disease or change its character, cannot supply the data for determining accurately its natural history. The facts furnished by the observation of such cases, consist, in part, of the phenomena of the disease, and partly of the effects of treatment; and, if the natural history of the disease be not already known, it is impossible to discriminate between the former and the latter. The clinical history of a disease, if based on the observation of cases in which therapeutical agencies of more or less potency have been employed,

is by no means the natural history of that disease; the therapeutical agencies employed, in proportion to their number and potency, have affected its phenomena, laws, etc., or given rise to events which have nothing to do with the disease.

These assertions are simple truisms, and when it is added that, simple as they are, they have not been heretofore, and are not even now, sufficiently appreciated by the medical profession, it is to be considered that, in the first place, the importance of knowing the natural history of diseases has not been, and is not always duly estimated, and, in the second place, that there are difficulties in the way of obtaining the facts on which the natural history of diseases is to be based. The importance of this knowledge is very great; for, if we are unacquainted with the natural history of any particular disease, we cannot tell in individual cases, whether the course of the disease be regular or eccentric; we are liable to doubt and error in the diagnosis and prognosis; in short, we are not prepared to judge of the present condition of the patient nor to anticipate coming events. Still more, the importance of this knowledge is shown in its bearing on the acquirement of information respecting therapeutics. The evidence of the curative efficacy of remedies is obtained by a comparison of cases in which they have been employed, with cases in which the disease has been let alone. Hence, medical experience, so far as regards the treatment of a disease, can never be complete or reliable without knowing its natural history. But the difficulties of obtaining this knowledge are great. We cannot observe cases of disease without employing therapeutical measures which we have reason to believe may contribute to the safety, welfare or even comfort of the patient. The clinical observer would be justly censured were he to withhold treatment which, in his opinion, would be useful, even for so desirable an end as obtaining data for the natural history of a disease. Hence, before he can deliberately allow diseases to pursue their course, he must be persuaded that he may do so without exposing his patients to suffering or danger, which the resources of his art would enable him to diminish or arrest. The magnitude of this difficulty is obvious, yet, within the last few years, much progress has been made in acquiring knowledge of the natural history of diseases; and I believe it is but just to say that this progress has been made under a due sense of the moral responsibility of the physician to the patient. It may be safely said that the knowledge in this direction already acquired has in no small degree exerted a salutary influence on the practice of medicine.

The purpose of this paper is to make a small contribution to our knowledge of the natural history of Articular Rheumatism. I shall submit the facts derived from the observation of a limited number (13) of cases in which this disease pursued its course, no therapeutical measures being employed with a view to any curative influence. The few measures resorted to had reference solely to the alleviation of pain. It is proper to state the

circumstances which led me to the conclusion that I could enter upon such a plan of clinical observation without impropriety.

Various methods of treating articular rheumatism have been in vogue, within the period of my own professional experience. Bleeding, local and general, together with other of the so-called antiphlogistic measures, mercury carried to ptyalism, colchicum given in doses to produce free purging and vomiting, the nitrate of potass an ounce or more daily, opium in full doses, the sulphate of quinia given largely, have been successively in vogue during the last twenty-five years; the treatment which of late years and at the present moment is generally adopted, being the administration of the salts of potassa or soda in sufficient quantity to render the union alkaline. The later method is generally known as the alkaline treatment. In 1854 I was led to analyze the cases of articular rheumatism of which I had kept records. I had notes at that time of twenty-four cases only. These were analyzed with reference to the ages of the patients, the seasons when the cases occurred, the previous health, mode of attack, the parts affected in combination and succession, the occurrence of heart complications, concomitant disorders of the nervous, pulmonary, digestive and urinary systems, the duration of the disease and the treatment.[1] As regards the treatment of these cases, in two, colchicum was given freely; in two, citric acid was the only remedy used; in several, nitrate of potass was prescribed more or less freely; in two, bleeding was practised; in eight, mercury entered into the treatment; in eleven, opium was used; in three, the sulphate quinine in full doses; in two, the iodide of potassium, and in one case lemon juice in large quantity was tried. The general conclusions drawn from the analysis of these cases with reference to the treatment, are contained in the concluding remarks as follows:—

"The results developed by the analysis of the few cases contained in this collection are of importance only as a small contribution toward the accumulation of facts by which, it is to be hoped, the merits, real and relative, of the several remedies that have been noticed may be determined. As the true point of departure for studying the effects of any, or all remedies, our science lacks here, as with reference to most other diseases, knowledge of the average duration, etc., of a series of cases in which the disease was allowed to pursue its course undisturbed by medicinal interference. This knowledge cannot be voluntarily and deliberately acquired. Facts bearing thereon can only be obtained slowly as chance supplies them. And, at the present moment, we cannot answer the question; what are the intrinsic tendencies of articular rheumatism as respects its continuance, its complications and remote consequences in the organism? Were we able to answer this question by an appeal to facts, we should then have a criterion by which to estimate the favourable or unfavourable influences of different methods of treatment pursued in a series of cases; as it is, in bringing statistical information to bear on the therapeutics of the disease, we can only study the immediate apparent effects of different remedies, and institute

[1] Vide Buffalo Medical Journ., No. for March, 1854, vol. ix. p. 557.

comparisons, in this point of view, and also with reference to the duration of the disease, etc., in different series of cases treated by different methods. So far as the observations go which have been presented in this paper, they lead to a distrust of the efficacy of the several remedies employed, rather than tend to increase confidence in our ability to control by means of them the progress of the disease. Some of the remedies appear to possess more or less palliative power. This is true of colchicum, bleeding, and opium; but as respects the duration of the disease, it was in some cases short and in other cases protracted under different remedies. This being so, it is perhaps more philosophical to attribute these differences to variations in the tendencies of the disease, in different cases, rather than to the agency of the remedies used. It is to be observed that under the use of several remedies supposed to possess more or less remedial efficacy in this disease, the complication most to be apprehended, viz: heart affection, became developed. This was true of colchicum, the nitrate of potass, calomel, and opium."

These remarks were published in 1854. Since that date the alkaline treatment has been very generally adopted. The reader need not be informed that the able writings of Dr. Henry Wm. Fuller have done much to establish this method. The statistics presented by Dr. Fuller, in his work on rheumatism, and in the clinical lectures at this moment in progress of publication in the *Medical News and Library*, certainly show a striking contrast between the results of the alkaline treatment and of the various methods formerly in vogue; but they do not show the results of the alkaline treatment as compared with the natural history of the disease. During the last eight years I have been accustomed to rely on alkaline remedies in the treatment of this disease; not, however, employing them in as large doses as Dr. Fuller recommends in his recently published lectures. The preparation which I have generally selected is the tartrate of potassa and soda, given until the urine is rendered alkaline. This is the article generally used in this city. At the Bellevue Hospital the standing remedy for rheumatism is a solution of the tartrate of potassa and soda with a small proportion of colchicum, known in the hospital as the anti-rheumatic mixture; and during my eight months' service in 1861–62 this mixture was employed in the cases of rheumatism admitted into my wards. I have not taken pains to keep records of the cases which I have observed during the last few years; but the impression which has been left upon my mind is, that, as regards the severity of the disease, its duration, and the liability to cardiac complications, the alkaline treatment, in my hands, has given results not materially different from those afforded by the methods of treatment previously in vogue. This is my impression; I will not say conviction, for I freely admit that I have not the data, derived from my own clinical experience, for forming a positive conclusion. Nor shall I argue in behalf of the probable correctness of this impression; my object in stating it being simply to show how I came to consider it appropriate to begin to observe cases of this disease in which no measures were employed with reference to a curative effect.

On entering on duty at Bellevue Hospital in August, 1862, I resolved to treat with palliative measures only the cases of articular rheumatism which should be received into my wards, so long as circumstances might lead me to conclude that, by continuing this plan, no injustice was done to the patients, whose relief was, of course, paramount to any other object. The cases thus treated progressed so satisfactorily that I found no ground for a discontinuance of the plan. The last case which came under my observation, in fact, was the only one in which any important complication occurred. Some of the cases were recorded by myself, and the remainder by my zealous clinical assistant, Dr. Shiverick. I shall proceed to submit a condensed report of all in which there had been no treatment of importance prior to admission into hospital, or before the cases came under my observation, as well as during the time they were under my charge. A few cases had been already under treatment, and I had not, therefore, the opportunity of carrying out my plan fully from the start. These cases are not included in the series now to be reported, and, in addition, one case in which the anti-rheumatic mixture of the hospital was given for several days in consequence of a misapprehension. The reported cases were treated throughout the whole course of the disease with only palliative measures. These measures, as will be seen, consisted of opium in some form, given in small or moderate doses, the application generally of dry flannel to the affected joints, and the use of either the soap and opium liniment, camphorated oil, or the tincture of aconite. But to secure the moral effect of a remedy given specially for the disease, the patients were placed on the use of a placebo which consisted, in nearly all of the cases, of the tincture of quassia, very largely diluted. This was given regularly, and became well known in my wards as the *placeboic remedy* for rheumatism. The favourable progress of the cases was such as to secure for the remedy generally the entire confidence of the patients. I may add that all the cases were brought before the medical class in attendance during the winter.

CASE 1. *Acute Rheumatism. Endocardial Murmur at the Base and Apex.*—Ann Malloy, aged 35, domestic, admitted Aug. 13, 1862. Had never before had rheumatism, and always enjoyed good health. On the 5th inst. the left wrist became painful, tender, and swollen; the next day the right wrist was similarly affected. Both wrists were still swelled, painful, hot, and tender. The left ankle and right elbow had also become affected; other joints not affected. Had kept the bed since the date of the attack. Moderate febrile movement. No treatment prior to admission.

In this case the *placeboic* remedy employed was a very weak solution of the sulphate of quinia, the patient not getting more than two grains in the twenty-four hours. A little opium was given at night. A lotion of lead and opium was applied to the affected joints, and the latter covered with oiled muslin.

When this case first came under observation, a soft systolic murmur existed at the apex, over the body, and at the base of the heart. The heart was not enlarged, and no pain or tenderness was referable to the præcordia.

August 19. The patient's condition remains about the same. No affection of other joints than those at first affected. Pulse 92.

23*d*. She reported, and was evidently better. No new joints had become affected; the affected joints less painful. Pulse 84. Some appetite.

The bowels were moved on the 21st with a saline laxative, there having been no dejection for several days. Dry flannel had been substituted for the lead and opium wash.

26*th*. No new joints affected; appetite fair, and she was allowed full diet. Pulse 75. She still kept the bed. Camphorated oil was applied to the affected joints.

28*th*. Convalescing and sitting up. Good appetite and no restriction of diet. The anodyne at night had been discontinued.

September 4. Had continued to improve. A soft, feeble murmur heard at the base and over the body of the heart, but not at the apex.

8*th*. The patient was discharged at her own request. No cardiac murmur was discoverable by Dr. Shiverick and myself.

21*st*. This patient called at the hospital, and reported that she continued free from rheumatism; she complained of weakness, and presented a pallid aspect.

Remarks.—The duration from the date of attack to convalescence was 23 days; the time in hospital was 26 days; the duration of convalescence was about 11 days. The joints affected were both wrists, one ankle, and one elbow. An endocardial murmur existed and disappeared during convalescence.

CASE 2. *Subacute Rheumatism. Endocardial Murmur at the Apex*.—Mary S. Watson, domestic, admitted August 20, 1862. The patient stated that her health had been good up to three weeks prior to her admission, when, after some exposure, she had pain in the back, not very severe, for which a sinapism was applied. She was next seized with pain in the left hip, and subsequently the left wrist and right knee had been affected. These joints were still affected, but in a moderate degree. She keeps the bed, not from necessity, but because she was more comfortable than when sitting up. She had had no medical treatment.

She was placed on the tincture of quassia largely diluted. Dry flannel to the affected joints.

August 24. Up and dressed. She complained of pain and soreness in the left ankle, right knee, and both shoulders. Pulse 72. Appetite good.

26*th*. Kept the bed, and complained of pain in the right knee, in both hips, and in both shoulders. The right knee was tender, and there was some effusion into the joint. Pulse 68. The appetite was tolerable, and she was allowed full diet. Bowels constipated.

A soft, feeble, systolic murmur was heard at the apex. The sounds of the heart were feeble, especially the first sound. The heart was not enlarged.

28*th*. Patient up and reported better. No new joints affected.

September 2. The patient left the hospital, reporting herself quite well. It is not noted whether or not the endocardial murmur existed at the time of her discharge from the hospital.

Remarks.—The duration from the date of the attack to convalescence was about twenty-eight days. The time in hospital was twelve days. The

duration of convalescence was five days. The joints affected were both hips, one wrist, one knee, and both shoulders.

CASE 3. *Acute Rheumatism. Murmur in the Pulmonary Artery.*—Margaret Evans, age 26, domestic, admitted August 29, 1862. A week before her admission the phalango-metacarpal joint of the left thumb became swelled, reddened, and painful. She poulticed it for three days. At the end of three days the right knee became affected. No other joints were affected prior to her admission, but directly afterward the right elbow became affected, the joints previously affected remaining so. She had had no medical treatment, excepting that she had taken a dose of castor oil. She was suffering much from the affected joints. She perspired occasionally. Pulse 80.

A faint, systolic, bellows murmur was appreciable at the base of the heart over the pulmonary artery.

The *placeboic* remedy was prescribed with an anodyne at night, and, for the affected joints, dry flannel and the soap liniment.

September 4. The affected joints were still quite painful, but no other joints affected. Pulse 94. Bowels constipated. The pulmonic murmur was still heard, and no murmur elsewhere. She had some appetite, and full diet was allowed.

6*th*. Some improvement. Pulse 80. No other joints affected.

9*th*. Much improvement; the patient sitting up.

15*th*. Patient up and about the ward.

October 6. The patient had progressively improved, and was discharged well on this date.

Remarks.—The duration from the date of the attack to convalescence was about seventeen days. The whole time in hospital was thirty-seven days; time after convalescence twenty-seven days. The elbow, knee, and phalango-metacarpal joint of the thumb were the only joints affected. It is not noted whether or not the basic murmur existed at the time of her discharge.

CASE 4. *Acute Rheumatism. Endocardial Murmur.*—Margaret Kelly, age 19, seamstress, admitted September 2, 1863. Two months before her admission she had intermittent (tertian) fever, which continued for a month. Had not recovered her former strength, when, on the 31st ult., she was attacked with pain and soreness in both knees, both ankles, and the right wrist. These joints only were affected on her admission. She had kept the bed since the 31st ult., and had had no medical treatment. The affected joints were painful, tender, swollen, and the ankle and knee-joints presented circumscribed erythema. The pulse was frequent, numbering on the day of admission 120. She perspired freely during the night. A faint, systolic murmur existed at the base of the heart.

The *placeboic* remedy was prescribed, and dry flannel to the affected joints.

September 4. The pain, etc., in the affected joints was diminished, and no other joints had become affected. Pulse 104. Perspiration continued. The murmur at the base of the heart continued, and was heard over the body of the heart, but not at the apex. At the base it was loudest over the pulmonary artery.

8*th*. Improvement continued, but the affected joints were still tender

and painful. No other joints affected. Pulse 100. Some appetite. A little morphia at night was prescribed. Prior to this date no anodyne had been given.

11*th*. Much better; the patient set up for a short time on the preceding day. Pulse 78. Perspiration had ceased.

13*th*. No tenderness in any of the affected joints, and the patient quite well.

24*th*. Patient left the hospital well. The endocardial murmur was faintly perceived.

Remarks.—The duration from the date of attack to the time of convalescence was about twelve days. Time in hospital twenty-two days. Both knees, both ankles, and one wrist only affected; and no joint affected after admission. Time in hospital after convalescence, fifteen days.

CASE 5. *Acute Rheumatism shortly before Admission. Relapse after Admission. The Affection Subacute.*—Anna Gross, aged 25, domestic, admitted August 25, 1862. This patient stated that two months previously she was attacked with rheumatism; that most of the joints were affected, and that she was confined to the bed for two weeks. She had had some remedies, but she was not able to state what they were. On her admission she was free from rheumatism, but complained of pain in the upper part of the chest, on the right side. On September 1st the left wrist-joint and right knee became swelled, tender, painful, and reddened. She complained also of pain and soreness in the right shoulder. Prior to the development of the rheumatism in hospital she was taking the sulphate of quinine. When the rheumatism occurred this was discontinued, and the *placeboic* remedy substituted; the affected joints were covered with flannel, and the soap and opium liniment applied to them.

September 4. The pain, etc., in the affected joints had diminished. No other joints had become affected. Pulse 84. No cardiac murmur. Some appetite.

8*th*. No other joints affected. The affected joints improving.

13*th*. The patient was up and about the ward. She was free from rheumatism, excepting that the dorsal surface of the left hand was swelled and painful.

16*th*. Patient left the hospital, some swelling and soreness of the dorsal surface of the left hand remaining, but otherwise quite well.

Remarks.—The duration from the relapsing attack in hospital to convalescence was thirteen days. Time in hospital twenty-two days. Time in hospital after convalescence three days. The joints affected were the left wrist and the right knee.

CASE 6. *Acute Rheumatism. Bellows Murmur at the Base of the Heart.*—Mary Hickey, aged 32, domestic, admitted August 27, 1862. She was attacked with pain, etc., on the day before her admission, in the right wrist; and, on the day of her admission, in the right knee-joint. These joints, when she was admitted, were tender, swollen, and presented an erythematous flush. No other joints were affected. The pulse was 116. No cardiac murmur was discoverable. She had never had rheumatism before, and she had had no medical treatment.

The *placeboic* remedy was prescribed, with flannel to the affected joints, and an anodyne at night.

August 30. The patient reported better. No new affection of joints. No cardiac murmur. She complained still considerably of the affected joints. Pulse 108. She had some appetite, and no restrictions were imposed as regards diet.

September 2. The patient still complained of the affected joints. No other joints affected. Pulse 96. Bowels constipated. Having learned that the patient was addicted to drinking gin, a little whiskey was allowed. The soap liniment was applied to the affected joints.

4*th*. The condition was about the same. No new affection of joints. Pulse 100. A feeble, systolic murmur was heard at the base of the heart; more marked over the pulmonary artery than over the aorta.

8*th*. Reported better. The affected joints were less painful, and no new joints affected.

11*th*. No material alteration.

15*th*. Much improved. Pulse 80.

20*th*. The improvement continued.

25*th*. The patient was up and about the ward.

October 7. The patient was quite well.

15*th*. She was discharged.

Remarks.—The duration from the date of the attack to convalescence was above twenty-six days. The time in hospital was forty-nine days. It is not noted whether or not the bellows murmur existed at the time of her discharge. Time in hospital after convalescence twenty-four days. The joints affected were the right wrist and the right knee.

CASE 7. *Acute Rheumatism. Aortic and Mitral Murmur.*—Catherine Shay, aged 25, domestic, admitted Oct. 15, 1862. About a month prior to her admission, the left-knee joint was painful, reddened, and swollen. At the same time the dorsal surface of the left hand was painful, reddened, and swollen. In about a week she had apparently recovered; but shortly the right knee-joint was attacked; she was obliged to take to the bed, and had remained in bed up to her admission, a period of two weeks. On her admission, the knee only was affected; she had taken some remedies before coming to the hospital, but did not know what they were. Pulse 106.

She had an aortic direct and a mitral systolic bellows murmur. The heart was not enlarged.

The *placeboic* remedy was prescribed, with an anodyne at night, and the affected joint was wrapped in dry flannel.

19*th*. The affected knee-joint remained about the same. The right ankle-joint became affected on this date. The tincture of aconite was applied to the affected joints with marked relief.

22*d*. The condition was about the same. A cathartic had been administered, the bowels having been constipated.

24*th*. Much improved. The knee-joint was now the only one affected, and the swelling, tenderness, and pain in this joint were much diminished. Pulse 96.

Nov. 4. Improvement had continued, and the patient was able to sit up; the cardiac murmur remained.

25*th*. Left the hospital, complaining of a little stiffness in the affected knee.

Remarks.—The duration from the date of attack to convalescence was about 30 days; time in hospital 40 days. In this case one joint only, the ankle, became affected after the admission into hospital, the knee-joint only having been affected prior to her admission. Time in hospital after convalescence, 31 days.

CASE 8. *Acute Rheumatism. Bellows Murmur at Base of Heart.*—Emma Stewart, age 20, domestic, admitted Oct. 15, 1862. The patient stated that about a month before her admission the right shoulder became painful and tender to the touch, and a week later the left shoulder became affected in the same way. A few days afterward, the right and left ankles became painful, tender, and swollen; and in a few days more the right elbow was affected. These joints remained affected. She had kept the bed part of the day for two weeks, and, within a few days, constantly. She had had no medical treatment. The day after her admission, the joints of two of the fingers of the right hand became affected.

A systolic bellows murmur existed at the base of the heart over the pulmonary artery. The heart was not enlarged.

17*th.* The left elbow became affected. The *placeboic* remedy was prescribed; the affected joints wrapped in flannel, the tincture of aconite applied, and an anodyne given at night.

20*th.* The patient was much better. The febrile movement, which previously existed, had subsided, the pulse now being 88. A laxative was prescribed, no dejection having occurred for several days.

26*th.* The sterno-clavicular articulation had become tender and painful. The affection of the joints, previously attacked, was much diminished.

29*th.* Improvement continued.

Nov. 4. The patient was sitting up. The affection of the joints had nearly disappeared.

21*st.* The patient was quite well. The date of her discharge is not noted.

Remarks.—The duration from the date of attack to convalescence was about 45 days. The duration from her admission to complete recovery was about 35 days. The duration after convalescence to complete recovery was 21 days. The finger joints of one hand, one elbow joint, and the sterno-clavicular articulation on one side became affected after admission; both shoulders, both ankles, and the right elbow having been affected prior to admission. It is not noted whether or not the bellows murmur at the base of the heart existed after recovery.

CASE 9. *Acute Rheumatism. Bellows Murmur at the Base of the Heart.*—Anna Irwin, aged 23, domestic, admitted October 23, 1862. She was attacked during the night of the 21st instant with pain, followed by swelling and tenderness, in the right knee-joint. No other joint had become affected. She had kept her bed since the attack. She had perspired freely, especially during the night. On her admission the knee-joint was considerably swollen, painful, and presented an erythematous flush. A bellows murmur existed at the base of the heart, over the acute and pulmonary artery. The pulse was 90.

The *placeboic* remedy was prescribed, with the tincture of aconite to the affected joint, which was enveloped in flannel.

October 26. No other joint affected. The knee was less painful, and the swelling diminished. Pulse 105. No dejection having occurred for several days, a dose of castor oil was prescribed.

29*th*. The patient much improved, and no other joint affected.

November 4. No other joint affected. The knee was still painful. The bellows murmur continued.

11*th*. The patient still kept the bed, but no other joint affected.

21*st*. The patient complained only of stiffness in the affected knee-joint.

December 12. Left the hospital quite well.

Remarks.—The duration from the date of attack to convalescence was about twenty-five days. Time in hospital was fifty days. Time in hospital after convalescence twenty-four days. No joint became affected after admission, and the knee-joint was alone affected during the continuance of the disease. It is not noted whether or not the bellows murmur existed at the time of her discharge.

CASE 10. *Acute Rheumatism. Bellows Murmur at the Base of the Heart*.—Roderick KNOX, aged 42, admitted December 30, 1862. The patient stated that he had rheumatism for the first time fifteen years before, and he had had the disease repeatedly since. The present attack occurred five weeks before his admission. Different joints had been successively affected, as follows: The right and left knee, the left and right ankle, and the left elbow. After his admission the left wrist became affected. He had had no medical treatment prior to his admission.

This patient, through a mistake, got the anti-rheumatic mixture of the hospital for two or three days. The *placeboic* treatment was then substituted.

January 8. No improvement. The small joints of the hands and feet have become affected. He kept the bed. Pulse 96.

13*th*. The patient complained of much pain in the affected joints. The existence of a systolic bellows murmur is noted. The tincture of aconite and flannel were directed for the affected joints, and the sulphate of morphia *pro re nata*.

22*d*. The patient was much improved. He was now sitting up, but unable to walk on account of tenderness of the ankle joints.

25*th*. The improvement continued. He complained only of tenderness of the ankle joints.

29*th*. Improvement continued. The cardiac murmur still existed. The murmur was limited to the base of the heart, over the pulmonary artery.

February 1. On this date I left the division. Under date of Feb. 24 it is noted that the patient left the hospital shortly prior to that date, but had been readmitted in consequence of a return of the rheumatism.

Remarks.—The duration from the date of the attack to convalescence was about fifty-six days. Duration after admission to convalescence about twenty-two days. The small joints of the fingers and toes became affected after his admission; both knees, both ankles, one elbow, and one wrist having been affected prior to admission.

CASE 11. *Acute Rheumatism. The Patient affected with Pulmonary Tuberculosis Non-Progressive.*—A. Crawford, cartman, age 54, admitted January 14, 1863. The patient stated that he had had rheumatism in July, 1862, lasting about six weeks. A week prior to his admission the right knee-joint became painful, tender, and swollen. The affection of this joint continued on his admission, and no other joint had become affected. The pulse was 96. He had no medical treatment prior to his admission.

The *placeboic* remedy was prescribed.

January 18. The affection of the knee continued, and he complained much of pain in this joint. No other joint affected.

22*d*. He remained about the same.

25*th*. The affection of the right knee continued, and he complained of pain in the left knee; but the latter was not swollen nor reddened. He also complained of pain in the right shoulder.

30*th*. The knee first affected was nearly free from pain, etc. The left knee was moderately affected. He complained of pain in the right shoulder and left foot.

This patient had made no complaint of any pulmonary symptoms, and I was led to auscultate the chest in order to obtain a good example of the normal murmur for class illustration. To my surprise I found bronchial respiration at the left summit, with dulness on percussion. I then ascertained that cough had existed since the preceding August. His aspect denoted health, and he did not think his cough of sufficient consequence to call attention to it.

February 1. I left the division on this date. The patient could be considered as convalescing. I subsequently ascertained that he continued to convalesce, and shortly afterward left the hospital.

Remarks.—The left knee, right shoulder, and left foot became affected after his admission. The affection of these joints, however, was slight; one knee only was affected prior to his admission. The duration from the date of attack to convalescence was about twenty-four days. Duration from admission to convalescence was about seventeen days. The absence of cardiac murmur is not noted; but all cases were examined repeatedly with reference to this point, and had a murmur existed it would doubtless have been noted.

CASE 12. *Acute Rheumatism. Bellows Murmur in the Aorta and Pulmonary Artery.*—Ann Burke, age 35, domestic, admitted January 31, 1863. She had rheumatism a year before the present attack, and was confined to the bed for six weeks. She recovered fully and remained well until three days before her admission. The right ankle was first affected, then the left, and obliged her to take to the bed. These joints were swollen, tender and painful on her admission. Pulse 90. Had had no medical treatment.

The *placeboic* remedy was prescribed, with an anodyne at night and the tincture of aconite to the affected joints.

February 6. The patient reported much better. No other joints affected. A faint bellows murmur existed at the base; and I judged from the difference in pitch of the murmur on the right and left sides of the sternum, that there were in fact two murmurs, one in the aorta and the other in the pulmonary artery. No murmur over the body of the heart or at the apex.

12*th*. No other joints had become affected, and the affection of the ankle-joints had so far disappeared that the patient was able to walk about without inconvenience.

14*th*. The patient was discharged quite well.

Remarks.—The duration from the date of the attack to convalescence was about twelve days. Time in hospital, fourteen days. No joints became affected after admission; both ankles being the only joints affected prior to admission. It is not noted whether or not the bellows murmur at the base of the heart existed at the time of her discharge.

CASE 13. *Acute Rheumatism, Endocarditis, Pericarditis, and Pneumonia developed. The latter affections treated with alcoholic stimulants, carbonate of ammonia and the chlorate of potassa in large doses. Recovery.*—Delia McNeil, age 20, domestic, admitted March 5, 1863. The patient stated that her health had been good excepting within the last two years. She had had during this period intermitting fever repeatedly. She was attacked four weeks before her admission with pain and tenderness in the left knee-joint and afterward in the right knee, the left ankle, the right ankle, in both shoulders, both wrists, and the left hip-joint. These joints were all more or less affected on her admission—the knees, ankles, and wrist-joints being swollen and reddened. She had kept the bed for thirteen days. During this time she had anorexia, thirst, frequent perspirations and the pain prevented her from obtaining much sleep. For three or four days prior to her admission she had had pain in the præcordia, for which a sinapism had been applied. Aside from this she had had no medical treatment. The pulse was 120.

A systolic murmur existed at the apex, propagated for some distance without the apex and indistinctly heard over the body of the heart. A murmur existed at the base over the pulmonary artery, and not over the aorta. There was moderate tenderness over the præcordia.

The *placeboic* remedy was prescribed, with the tincture of aconite over the affected joints, and Dover's power at night.

March 7. On this date there was present a well-marked pericardial friction murmur, with the symptoms of acute pericarditis. This sign and the symptoms of pericarditis were not present on the previous day. The friction murmur had its maximum over the sternum on a level with the nipple; it extended over the præcordia but not without it; it was double and intensified notably by pressure with the stethoscope. A feeble cardiac impulse was felt in the fourth intercostal space between the nipple and sternum. Marked dulness on percussion existed within a line on the left side, extending from the second rib on the median line half an inch without the *linea mammalis* in the left side, and, on the right side, half an inch without the right margin of the sternum. The pulse was 120, of fair volume and strength. The respirations were 66. There was sharp pain in the præcordia on deep inspiration.

Four ounces of whiskey daily were directed, and opium in sufficient doses to procure relief. Oiled muslin was applied over the præcordia.

8*th*. The patient was more comfortable. The pulse was 116, soft and feeble; the respirations were 48; she perspired freely; the ankle and knee-joints and the left wrist-joint were painful and tender. The friction murmur was louder than on the previous day; the limits of dulness on percussion were somewhat extended. The treatment was continued.

9th. Pulse was 112; respirations were 35; continued to perspire freely; The dulness in præcordia did not extend over a wider space than on the previous day. Treatment continued.

10th. Pulse 100, with more volume and force; respirations 32; the friction sound less intense. Treatment continued.

11th. The patient reported having suffered much from pain in the præcordia, which was quite tender on pressure. Pulse 104; respirations 36. A dejection to day, and not previously for several days. She perspired freely. The affected joints were tender but not painful. The friction-murmur continued. The mitral systolic bellows murmur was faintly heard. Treatment continued.

12th. The patient complained of præcordial pains. Pulse 120; the friction-murmur continued. No evidence of an increase of the pericardial effusion. A poultice to the præcordia was directed, the opium to be increased and the whiskey continued.

14th. No alteration in this case was noted until on this date, when she became much worse. The pulse became extremely rapid and feeble; she was greatly prostrated, and seemed almost moribund; she complained of severe pain in the chest. This unfavourable change followed suspension of the whiskey, which was done at the patient's desire as preparatory for the rite of communion. The whiskey was resumed and given more freely, six ounces being taken in five consecutive hours. A grain of opium was given hourly. Under this course of treatment she was measurably relieved, and the symptoms were improved.

15th. The examinations of the chest for several preceding days had been limited to the præcordia. On this date, the examination being extended, revealed the signs of pneumonia affecting the lower lobe of the left lung. Marked dulness on percussion, and the bronchial respiration existed over this lobe. The symptoms again, on this date, denoted impending dissolution. The lips were livid and the face had a dusky hue; the pulse was 128; the respirations were 60. Some tracheal rales were heard at a distance. I regarded the prognosis as unfavourable as possible. My directions were simply to sustain the patient vigorously. The details of the treatment were left to the house physician of my division, Dr. W. M. James. The measures pursued from this date until marked improvement took place, were prescribed by him and carried out under his attentive direction. I am also indebted for the subsequent history to the copious notes made daily by Dr. James, or by the senior assistant on the division, Dr. J. C. Stone.

On the afternoon of this date (15) the hypodermic injection of ten drops of Magendie's solution was employed; half an ounce of whiskey was given every twenty minutes, and five grains of the carbonate of ammonia every fifteen minutes. In the evening thirty grains of the chlorate of potassa and a grain of opium were given hourly. At 11½ P. M. the appearance of the surface had improved. The skin was warm and dry; the pulse was 122, with considerable volume and force; the respirations were 60.

16th, 1 A. M. Pulse 120; respirations 60; free perspiration. 2½ A. M. Sleeping; pulse 120; respirations 34. *Since 9 P. M. she had taken half an ounce of whiskey, five grains of the carbonate of ammonia and fifteen grains of the chlorate of potassa every half hour, with occasionally a few drops of Magendie's solution.* From 6 A. M. to 9 A. M. the whiskey and all medicine were suspended. At 9 A. M. the lips were livid, the face was dusky, the pulse 130, and the respirations 55. She was then ordered carbonate of ammoniæ gr. xx; whiskey ℥ss; and chlorate of potassa

gr. xv, every half hour. At 11 A.M. the countenance was less dusky, the lividity of the lips was gone, the respirations were 45, and the pulse was 120. At 7 P.M. the pulse was 120, and the respirations were 44. The whiskey was increased to ℥vi every half hour. At 9 the pulse was 130 and the respirations were 54. The whiskey was increased to ℥x every half hour. At 12, midnight, the pulse was 120 and the respirations were 42. The skin was moist and the colour of the face normal. The stomach being irritable, the carbonate of ammonia was reduced to gr. x given hourly by enema. The chlorate of potassa gr. xv hourly was continued.

17*th*. The pulse at different periods of the day varied from 120 to 130; the respirations from 44 to 60. The countenance was natural, and she perspired freely. Several watery dejections occurred, which were checked by an enema of starch and laudanum. Bronchial breathing continued over the lower lobe of the left lung. At 6 P.M. the patient had taken during the preceding twenty-four hours: Whiskey ℥xxiv; carbonate of ammonia ℈iv; chlorate of potassa ℥ss; also, strong beef-tea Oj, eggs 4, and milk Oj.

18*th*. The pulse varied from 120 to 132; the respirations from 40 to 60. The skin was moist. During the twenty-four hours there were given: Whiskey ℥l; carbonate of ammonia gr. lxxx; chlorate of potassa ℥ss, and opium gr. 1 every four hours; also, beef-tea Oj, eggs 4, and milk Oj.

19*th*. The pulse varied from 120 to 128; the respirations from 54 to 60. The pulse had considerable volume and force. Countenance and skin normal; she vomited several times a greenish liquid containing mucus. During the twenty-four hours there were given: Whiskey ℥xxxviij; also, eggs 4, beef-tea Oj, milk Oij. The ammonia and chlorate of potassa were discontinued at the instance of Dr. Flint.

20*th*. The pulse varied from 120 to 130; respirations from 40 to 52. Diarrhœa occurred, and was arrested by an enema of starch and laudanum. Vomiting of greenish liquid and mucus also occurred. She drank freely of the effervescing mixture, and took of Magendie's solution ten drops. During the twenty-four hours, there were given: Whiskey ℥xvj; also beef-tea Oj, eggs 4, and milk Oj.

21*st*. The pulse 120; respirations varied from 44 to 56. The whiskey and nourishment the same as on the preceding day.

22*d*. Pulse 120; respirations 50. General improvement from day to day was manifest. The whiskey and nourishment the same as on the preceding day.

25*th*. Pulse 120; respirations 42. The whiskey was diminished to ℥j every three hours. The bicarbonate of soda gr. v every two hours, was prescribed, and Tulley's powder of opium *pro re nata*.

The pericardial friction-murmur was still heard, and the respiration was still bronchial over a part of the lower lobe of the left lung.

27*th*. Pulse 132; respiration 42. She complained of pain and soreness in several joints. She took whiskey ℥viij in the twenty-four hours.

31*st*. Under this date the following note was made by myself: "This patient has progressively improved. The respiration has become vesicular over the whole of the lower lobe of the left lung. The apex-beat is feebly felt in the fifth intercostal space. The friction-murmur has disappeared. The mitral systolic bellows murmur continues." I did not note the pulse and respirations, but the patient was distinctly convalescent on this date,[1] which terminated my period of service.

[1] May 11. This patient has continued to convalesce, and is now quite well.

Remarks.—I have given a condensed account of the history of this case from day to day after the development of pericarditis and pneumonia up to the time when the improvement was fairly under way, with reference to the treatment which was pursued. The treatment was determined by the existence of the affections just named, without regard to the fact that these affections were developed in the course of rheumatism. The whiskey and nourishment were given to support the powers of life, or, in other words, to obviate the tendency to death by asthenia. The chlorate of potassa was given under the idea of introducing by this remedy oxygen into the system, and was directed to the danger from apnœa, and the carbonate of ammonia was given with a view of preventing the coagulation of fibrin in the heart-cavities. These measures were employed by Dr. James at a time when I considered the case as desperate. The quantities given of each were very large. The lividity disappeared in a short time under their use. They were all suspended for several hours on one day for the purpose of observing the condition of the patient without them, and the symptoms became distinctly worse. The ammonia and chlorate of potassa were continued for several days, but at length appeared to occasion vomiting and diarrhœa, and they were in consequence withdrawn. How far the measures employed contributed, severally or collectively, to the favourable issue of the case, I leave, without discussion, for the judgment of the reader. But I cannot close these remarks without expressing my admiration of the zeal and fidelity of Dr. James and his assistant Dr. Stone, who observed and noted the symptoms of the case at intervals of a few hours during night and day, until the period of extreme danger was passed. That the patient would have died without this assiduity cannot of course be proven; but I think the reader will agree with me in thinking it highly probable that her life was saved by their exertions. Whether the success would have been secured by the alcoholic stimulus and nutriment without the ammonia and chlorate of potassa, is a question which I do not feel prepared to answer, but I cannot avoid the conjecture that the latter might have been dispensed with.

I have entitled this paper "A Contribution toward the Natural History of Rheumatism." I have not intended, by reporting these thirteen cases, to furnish data for determining the symptomatology of the disease. The cases are not only too few for this, but they were not recorded with sufficient completeness as regards the symptoms, and, in reporting them, I have condensed the records within narrow limits. My object is to analyze the cases with reference only to the following points pertaining to the natural history: The duration of the disease, and of convalescence; the number of joints affected, and the occurrence of affections of the heart or other complications. I shall proceed to consider the facts under these three heads. It will be observed that, of the thirteen cases in all but two the disease was acute; that is, the local phenomena denoted more than a slight

arthritic inflammation, and the febrile movement was more or less marked. In two cases the disease was sub-acute.

Duration of the Disease and of Convalescence.—The duration of the disease from the date of the attack to convalescence (excluding the case complicated with pericarditis and pneumonia), varied between twelve and fifty-six days. The duration was under fifteen days in three cases; over fifteen and under twenty days in one case; over twenty and not over twenty-five days in three cases; over twenty-five and not over thirty days in three cases; and in the remaining two cases, the duration was in one case forty-five, and in the other case fifty-six days. The mean duration was a small fraction under twenty-six days.

The duration from convalescence to the date of discharge, or complete recovery, varied from five to twenty-seven days. The mean duration was a fraction over sixteen days.

The time in hospital varied from twelve to fifty days, the mean being a fraction over thirty days.

These results go to show considerable diversity as regards the intrinsic tendency of this disease to end after a certain period. They show, however, that the disease does end from self-limitation after a duration varying in different cases. They go to show, also, that the mean duration, without curative treatment, cannot greatly exceed the average length of the disease when active measures are employed with a view of controlling it. These conclusions are admissible as deductions from the analysis of the small number of cases reported in this article; but, of course, a much larger collection of cases is desirable in order to determine fully the laws of the disease with respect to duration. As remarked by Valleix, this is one of the most important of the points belonging to the clinical study of this disease; for, since the disease is generally unattended by any immediate danger to life, the chief object of treatment, aside from the prevention of grave complications, is to abridge its duration. And as a standard for determining, by comparison, whether measures employed to cure the disease do exert a curative effect, its natural history, as regards the laws of its self-limitation, must be ascertained.

In my former report I gave the results of an analysis of seventeen cases, with reference to the duration from the date of attack to convalescence. The average duration in these cases was less than that of the cases in the present collection, being a fraction over seventeen days. Of the seventeen cases, in four convalescence occurred under twelve days. These cases were treated actively by different measures. It is fair to suspect that in some of these cases the disease was abridged; but it may, with equal fairness, be suspected that in a certain proportion, and perhaps the larger proportion of cases, whatever be the treatment pursued, this disease obeys its own laws as respects continuance.

The Number of Joints affected.—The following is a recapitulation of the joints affected in each of the cases:—

Case 1. Both wrists, one ankle, and one elbow.
" 2. Both hips, one wrist, one knee, and both shoulders.
" 3. One knee, one elbow, and phalango-metacarpal joint of thumb.
" 4. Both knees, both ankles, and one wrist.
" 5. One wrist and one knee.
" 6. One wrist and one knee.
" 7. One knee and one ankle.
" 8. Both shoulders, both ankles, both elbows, the finger joints of one hand, and the sterno-clavicular articulation on one side.
Case 9. One knee only.
" 10. Both knees, both ankles, one elbow, one wrist, and the small joints of fingers and toes.
Case 11. Both knees, one shoulder, and one ankle.
" 12. Both ankles.
" 13. Both knees, both ankles, both shoulders, both wrists, and one hip.

The important topics of inquiry under this head are, *first*, Are a greater number of joints affected; and, *second*, Is the affection of the joints of greater intensity, when only palliative measures are employed, than when the disease is treated by measures supposed to be curative?

With respect to the first of these topics, an examination of the foregoing recapitulation will, I think, satisfy the reader who has had much practical acquaintance with articular rheumatism, that these cases will compare favourably with cases as they ordinarily occur in practice when treated by the different methods which have been in vogue. As regards the second topic, I can only give the impression left upon my mind after the observation of these cases; and my impression is, that the average intensity of the affection was not greater than a practical acquaintance with the disease would lead us to expect in the same number of cases treated with active remedies.

Affections of the Heart and other Complications.—I come now to the most important of the subjects belonging to the clinical study of articular rheumatism. This disease involves immediate danger to life only when pericarditis or some other grave complication becomes developed. The occurrence of endocarditis, which modern researches have shown to be a frequent complication, although it does not place life in immediate jeopardy, renders the patient liable, at a period more or less remote, to serious organic lesions of the heart. Clinical observation shows that, of persons affected with valvular lesions a very large proportion have been affected with articular rheumatism. Hence the complications of this disease, and especially those of the heart, are the events to be most dreaded. So far as regards treatment, measures on which reliance might be placed to prevent the occurrence of pericarditis and endocarditis are much more to be desired

than measures to abridge the duration of the disease, to limit the number of joints affected, to diminish the intensity of the arthritic inflammation, or to relieve the sufferings of the patient. With a full appreciation, then, of the importance of this point of inquiry, I proceed to review the cases which I have reported, with reference to cardiac complications.

An endocardial or bellows murmur existed in eleven of the thirteen cases. Was endocarditis developed in this large proportion of cases? I do not hesitate to answer this question negatively. The murmur was limited to the base of the heart in all but three cases; it was limited to the site of the pulmonary artery in two cases. I have for some time ceased to regard a murmur over the aorta or pulmonary artery as evidence of endocarditis in rheumatism. I suspect such a murmur will be found in the majority of cases, especially in females, if a careful examination be made with Cammann's stethoscope. It is to be remarked that, of the thirteen cases, all but two were females. I have also been led to doubt whether a murmur at the apex and over the body of the heart, developed in the course of rheumatism, is to be regarded as in itself, sufficient evidence of endocarditis.[1] A murmur in these situations may be developed and disappear during convalescence; this was observed in one of the three cases in which a murmur existed at the apex. There is reason to believe that murmurs here, as well as at the base, may be of hæmic origin. To be evidence of endocarditis, a murmur must be mitral, developed under observation, persisting, and having a certain degree of intensity, and it should be associated with some symptoms denoting a cardiac affection; viz., pain or uneasiness in the præcordia, tenderness, and greater disturbance of the heart's action than is consistent with the febrile movement belonging to the rheumatic affection. With these views I did not consider that there were adequate grounds for the diagnosis of endocarditis, save in one case, in which pericarditis also existed (Case 13). Of the correctness of this judgment the reader will, of course, form his own opinion. It is an open question, and one difficult to settle, as to the source and significance of a mitral or intra-ventricular murmur in cases of rheumatism. I have given briefly the views which I have been led to entertain, and which are strengthened in my mind by their coincidence with the views lately enunciated by Dr. Fuller. In leaving this point, I would state that I am accustomed to use habitually Cammann's stethoscope, and that murmurs are discovered by means of this instrument which elude detection when the ear is applied directly to the chest or the wooden cylinder is used. The large proportion of cases in which a murmur at the base was noted is perhaps to be thus explained.

Pericarditis was developed in one of the cases. And in this case pneu-

[1] Dr. Fuller's remarks on this point, in the lecture republished in the *Med. News and Library*, number for March, 1863, seem to me to be sound, and I would commend them to the reader's attention.

monia occurred shortly after the development of pericarditis. This case was the last one under observation. Had it been at an earlier period I might have been deterred by it from continuing the plan which I had adopted; but up to the occurrence of this case, all the cases had pursued a favourable course, without any important complication. Endocarditis was supposed to exist when this patient was admitted. The diagnosis of this complication was based on a pretty loud mitral systolic murmur, propagated without the apex. It was also heard on the back. And with this were associated tenderness over the præcordia, and an excited action of the heart greater than would be expected from the rheumatic affection alone. The pericarditis was developed on the second day after her admission, and the pneumonia a few days subsequently. The endocarditis already existing, and the pericarditis being developed so quickly after admission, I am relieved of responsibility as regards the adoption of therapeutical measures which it may be supposed might have prevented these complications. The question, therefore, is, would these complications have been prevented had the patient entered the hospital sooner, and active treatment been at once employed? This question I shall not presume to answer. The case illustrates the well known fact in the natural history of articular rheumatism, viz., that endocarditis, pericarditis and pneumonia are developed in a certain proportion of cases. The gist of the question is, whether the introduction of alkaline remedies, or any other method of treatment, will render the patient secure against, or less liable to, these complications. I certainly have no desire to come to the conclusion that these complications are not preventable; but it is certain that the different methods of treatment heretofore in vogue have failed to prevent their occurrence. Dr. Fuller, in the lectures already referred to (which have fallen under my notice since the greater part of the cases now reported were observed), claims that the prompt and efficient employment of the alkaline treatment will afford a complete protection against the cardiac affections. He administers about two drachms of some alkaline carbonate, or its salts, every three or four hours, inducing alkalinity of the urine generally within twenty-four hours. When this result is brought about he considers the patient safe as regards endocarditis and pericarditis. He affirms that these affections have not occurred in any case under his observation when the opportunity for pursuing this treatment has offered. I have not been accustomed to give alkaline remedies to such an extent, and, so far as I know, it is not the custom with the practitioners in this country who have adopted the alkaline treatment. Should clinical experience establish the efficacy of the method pursued by Dr. Fuller, it will assuredly deserve to rank among the most important of modern discoveries in practical medicine.

ART. II.—*Reports of Cases of Resection.* By C. WAGNER, M.D., Assistant Surgeon, U. S. A., Medical Director 2d Division 5th Army Corps.

DURING the past few years, the operations belonging strictly to conservative surgery have assumed the highest importance. Before the present rebellion, and the recent wars on the Continent of Europe, they were regarded with distrust and suspicion, by most civil surgeons, and in this country particularly, they have been greatly neglected, owing in a great measure to the absence of reliable statistical information. The valuable monographs of Hodges, of Boston, and Heyfelder, of Vienna, should remove all doubts as to the propriety and expediency of operations which not only save limbs, but are attended with less fatality than amputations.

The results of the following cases, the reports of which are drawn up by Acting Medical Cadet I. S. LOMBARD, U. S. Army, will, I think, stand a fair comparison with others. The after-treatment, upon which so much depends, was very simple; splints were applied in one case only. Two cases of partial resection resulted unfavourably; Case IV. in death, the other (not reported), in which resection of the head of the ulna was performed, the forearm was subsequently amputated, and the patient recovered.

CASE 1. *Gunshot Wound of the Elbow-joint. Resection performed.*—Henry McMurphy, æt. 28, a private in the 5th N. H. Vols., was wounded at Fredericksburg, Dec. 13th, by a minie ball, which striking the posterior aspect of the left ulna, about two inches below the extremity of the olecranon, shattered the bone, breaking off its upper extremity, and involving the joint in the fracture; a piece of bone composed of a small portion of the shaft of the ulna, half of the lesser, and a piece of the outer edge of the greater sigmoid cavities, being split off. The ball lodged in the arm, and was removed on the field. When the patient was admitted to this hospital, three days after the reception of the wound, there was very little swelling or inflammation in the arm, slight motion in the injured joint, every movement of which caused the man great pain.

December 18. It was decided to resect, and the patient having been brought under the influence of chloroform, the articulation was exposed by Moreau's method, and the condition of the bones found to be such as described above. The upper extremity of the ulna was next disarticulated, and the shattered extremity of the lower portion of the bone sawn off. The head of the radius was uninjured, but was removed, in order that the parts might be brought into closer apposition. A small piece of the articular surfaces of the humerus was now shaved off, and the edges of the wound brought together, and a bent gum splint applied to the flexor side of the arm and forearm.

The operation was performed by Clinton Wagner, Asst. Surgeon, U. S. Army, in charge of Hammond General Hospital. The following day, there being some inflammation in the arm, the splint and sutures were removed, and the arm laid on a pillow, with the forearm pronated and slightly flexed, and cold water dressing applied. The progress of the case was on the whole favourable. By the end of the third week passive motion was made,

and from time to time repeated. By the last of February the external wound had healed, the arm could be fully flexed and extended by passive motion, with slight pronation and supination.

CASE 2. *Gunshot Wound of the Elbow. Resection.*—James Douglass, a private in the 63d Penna. Vols., was wounded at Fredericksburg, Dec. 13th, by a minie ball, which entered on the external aspect of the left forearm, about over the neck of the radius, and made its exit just above the inner condyle, shattering in its course the radius at its neck, and breaking off portions of the coronoid process, internal aspect of the olecranon and trochlea. The patient was admitted to Hammond General Hospital Dec. 16th.

January 12. Resection of the injured bones was performed by Asst. Surgeon W. H. Gardner, U. S. A. The joint having been exposed by the quadrilateral flap operation of Moreau, the radius was sawed off just below its tuberosity. The upper extremity of the ulna, and the articular surface of the humerus were also removed. After the operation the limb was laid on a cushion, with the forearm pronated and slightly flexed. When last seen, March 6th, 1863, the movements of the joint were tolerably free, extension full, flexion about five degrees above a right angle, slight pronation and supination, the movements increasing almost daily.

CASE 3. *Gunshot Wound of the Elbow-Joint. Resection performed.*—Private Jeremiah Wellover, of the 181st Penna. Vols., æt. 22, was wounded at the battle of Fredericksburg, Dec. 13th, by a minie ball, which entering the posterior aspect of the left arm, shattered the olecranon, and lodged just in front of the inner condyle, whence it was extracted soon after his arrival at Hammond General Hospital, which was Dec. 16th, 1862.

January 10. Resection of the injured joint was performed by Dr. Theo. Siebold, Acting Asst. Surgeon, U. S. A. The articulation having been exposed by the longitudinal incision advised by Langenbeck; the ulna was sawed off just below the coronoid process, also the head of the radius, and the articular surfaces of the humerus. The head of the radius escaped injury, and the articular surfaces of the humerus were but slightly comminuted. After the operation the forearm was placed at a right angle with the arm, and retained in this position by a plaster of Paris splint.

February 16. The splint was removed, and the arm laid on a cushion, with the forearm slightly flexed, and the hand pronated. When the patient was last seen, Feb. 28th, the external wound had healed, and the movements of the joint entirely free, extension full, flexion ten degrees above right angle, and increasing daily; pronation and supination free to full extent.

CASE 4. *Gunshot Wound of the Forearm, with Fracture of the Ulna. Resection of the upper extremity of the injured bone.*—Private Alfred Hunt, of the 72d N. Y. Vols., was shot through the left forearm at Fredericksburg, Dec. 13th, by a minie ball, which shattered the ulna extensively about its middle third. After his admission to Hammond General Hospital, Dec. 16th, a number of small pieces of bone came out from time to time mingled with the discharge from the wound, which was very profuse. As no improvement took place in the case during the month of December, and as the mans's health was evidently giving way under the irritation and profuse suppuration of the wound, operative interference was deemed necessary, and on the 11th of January, chloroform having been administered, an incision was made along the internal and posterior aspect of the bone, from the in-

ner condyle downwards, for the distance of four inches. The bone having been thus exposed, was next disarticulated at the elbow, and removed; the shattered extremity of the lower portion was then sawed off, thus removing in all, about half of the bone. The operation was performed by Asst. Surgeon C. Wagner, U. S. Army, in charge of Hospital. He died on the 12th day after the operation, of pyæmia.

CASE 5. *Gunshot Wound of the Shoulder with Fracture of the Head of the Humerus. Resection performed.*—Robert Campbell, æt. 28, a private in the 4th New York Vols., while lying on his face, exposed to a sharp fire at the battle of Fredericksburg, December 13, 1862, was struck by a minie ball in the left shoulder, about two inches to the outside of the extremity of the acromion. The ball shattered the inner and posterior aspect of the head of the humerus, and then passed down and lodged on the inside of the arm just below the axilla, and was extracted a few days after the battle. When admitted to Hammond General Hospital, December 16, the patient was suffering from chronic diarrhœa, which continued for some time after his arrival unchecked, and reduced him so much that he appeared too weak to endure an operation. He also suffered an attack of jaundice. During the first part of January, 1863, the man improved so much that on the 17th, chloroform having been administered, the head of the bone was resected by Assistant Surgeon C. Wagner, U. S. Army, in charge of hospital. The articulation was exposed by the V-shaped incision, and the bone sawed across just below the tuberosities. The glenoid cavity, acromion, and coracoid escaped injury. The after-treatment consisted in placing a pad in the axilla and supporting the arm in a sling. Cold water dressing. The wound healed favourably. At the time of writing, March 10, the patient has full and free use of the forearm, and by passive motion the arm can be elevated to a right angle with the body, and has all the other movements except rotation. Voluntary motion is increasing almost daily.

CASE 6. *Gunshot Wound of the Elbow with Fracture of the Inner Condyle and Olecranon. Resection performed.*—Private Morris Lewis, of the 133d Pa. Vols., æt. 19, was wounded at the battle of Fredericksburg, December 13, 1862, by a minie ball in the posterior aspect of the left arm just over the olecranon. The inner portion of the olecranon was shattered, and the inner condyle with a portion of the trochlea broken off. The ball lodged among the muscles on the anterior aspect of the forearm about over the head of the radius, and was cut out December 25. The patient arrived at Hammond General Hospital December 16. At this time his general condition was good, and continued so after his admission. There was considerable swelling of the elbow and forearm, which alternately subsided and increased every few days up to the time of operation.

January 15, 1863. Chloroform having been administered the articulation was exposed by the quadrilateral flap operation of Moreau, and the olecranon sawed off at the base of the coronoid process. The detached inner condyle which was thrown forwards and inwards was next removed, and the ulnar nerve was found to be intact. The lower extremity of the humerus was then sawed off just above the condyle. The operation was performed by Dr. T. H. Allison, Act. Asst. Surgeon, U. S. A. The flap was laid back and the edges of the wound brought together and retained by eight sutures.

21*st*. Strips of adhesive plaster were applied in order to bring the edges of the wound into closer apposition, an opening being left for the escape

of pus. After the operation the arm was supported by a cushion, the forearm being pronated and slightly flexed. The case did well, and when last seen the wound had healed. The joint has motion as follows, extension very nearly perfect, flexion about ten degrees with elbow at a right angle, and about half the full extent of pronation and supination; movements increasing daily.

CASE 7. *Gunshot Wound of the Shoulder-Joint. Resection performed.* Sergeant Michael Dolan, æt. 25, of the 2d U. S. Infantry, was wounded at the battle of Fredericksburg, December 13, in the left shoulder by a conical ball, which, striking the tip of the acromion, comminuted it slightly, and then passing into the articulation shattered the head of the humerus, splitting the shaft of the bone for the distance of two inches below the tuberosities, and finally lodged in the anterior and inner aspect of the bone. At the time of the reception of the wound the patient was lying on the ground resting on his elbows. When admitted to Hammond General Hospital, December 16, there was great swelling of the joint, and the patient seemed much debilitated. All attempts to discover the ball failed. The patient was freely stimulated and carefully watched in order to bring him up sufficiently to endure resection. Early in March his condition had improved sufficiently to warrant an operation. He was, therefore, etherized, and the articulation exposed by a V-shaped incision, and the humerus sawed across about two inches below the tuberosities. The ball was found on the inner aspect of the bone about an inch and a half below the head. The glenoid cavity was somewhat ulcerated. At the time of writing, March 25, his condition is such as to warrant hopes of a successful termination. The operation was performed by I. Stearns, Jr., Act. Asst. Surgeon, U. S. A.

CASE 8. *Gunshot Wound of Hand. Resection of the Metacarpal Bones.*—Joseph Shingledecker, Co. A, 134th Pennsylvania Volunteers, wounded at Fredericksburg, December 13, 1862, was admitted into Hammond General Hospital December 16, 1862. Gunshot wound of right hand. Ball striking the index finger, shattering the first phalangeal bone, and passing obliquely across the hand shattering the third, fourth, and fifth metacarpal bones, injuring the soft parts materially but not destroying the tendons. Wound very much inflamed, swollen, and presenting an unfavourable appearance.

Treatment.—Slippery-elm poultices.

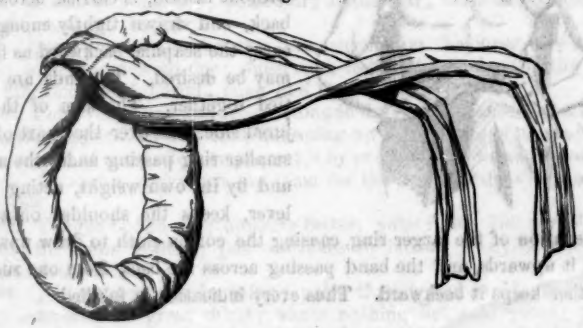
On the 20th of December the wound looking less inflamed, the general health good, and there being no hope of reunion of the bones, owing to the extent of injury, ether was administered and an incision made over the first phalangeal bone of the index finger and the entire bone removed. The third, fourth, and fifth metacarpal bones were removed in the same manner, viz: by longitudinal incisions. The soft parts were then brought together, the hand placed on a splint, with cold water dressing. The wound healed kindly with no unfavourable symptoms, and the patient left the hospital on the 20th of March, the wound entirely healed; the muscles having contracted so as to bring the end of the second phalangeal bone of the index finger very close to the head of the second metacarpal bone.

The hand presented a contracted but well-shaped appearance; loss of motion in the index finger, slight motion in the middle and ring fingers, full and perfect use of the little finger and thumb; the patient could write a fair and very legible hand.

ART. III.—*Description of an Apparatus devised for Fracture of the Clavicle.* By Surgeon J. C. PALMER, U. S. N. (With three wood-cuts.)

A SHEET, folded so that it shall be transversely two feet six inches, is rolled into a cylinder three inches in diameter. This is placed longitudinally in the middle of a piece of cotton cloth six feet six inches in length, rolled up tightly, and fixed by stitches. The free cotton cloth extends two feet from each end of the cylinder. The latter is bent so that one end overlaps the other about three inches, and is secured in this position by stitches. One loose end of the cloth is carried once over the cylinder near the other end, and through the oval opening (see Fig. 1). This is for the uninjured side.

Fig. 1.



For the injured side another cylinder is constructed in a similar manner, with these exceptions: It is but one foot six inches in length, one inch and

Fig. 2.

a half in its transverse diameter, and is rolled longitudinally into one end of a piece of cloth three feet six inches in length, so that there is but one free end of cloth, and that two feet long (see Fig. 2).

By passing the arms through the oval openings, the rings are placed so that they pass under the axilla and over the acromion processes. The larger ring, where its ends overlap each other, extends upwards and backwards about four inches when yielding to pressure. The free cotton cloth extending from the higher overlapping end, is passed under the opposite ring, and the free end of this latter is in like manner passed through the larger ring (see Fig. 3). These two are brought to a proper tension for lifting the injured shoulder, and are so held by an assistant. Then the free cloth extending from the lower end of the larger cylinder, and passing through the smaller one, from without inward, is carried across the back, and drawn tightly enough to carry the scapulæ backward as far as may be desired. The ends are then tied together. The arm of the injured side falls over that part of the smaller ring passing under the axilla and by its own weight, acting as a lever, keeps the shoulder outward; the elevation of the larger ring, causing the cotton cloth to draw upwards keeps it upwards, and the band passing across the back from one ring to the other keeps it backward. Thus every indication is fulfilled.

Fig. 3.

ART. IV.—*Report of five cases of Gunshot Injury of the Knee-joint, treated at Mansion House Hospital, Alexandria, Virginia, May* 16, 1863. By J. B. BELLANGER, Act. Asst. Surg. U. S. Army.

So discouraging was the result of secondary amputations, after the battles of Cedar Mountain and Bull Run *No.* 2, for injuries of the knee-joint, at this hospital, that it was determined, on the next favourable occasion, to try the effect of conservative surgery, and see if a better success would not follow if the joint was freely laid open at an early period, all loose bone removed, all collections of pus in the neighbourhood of the joint evacuated as soon as detected, and the parts constantly irrigated by ice water. After the battle of Fredericksburg, Dec. 13, 1862, six cases of gunshot injury of the knee-joint were received into this house; in one, the

most favourable case, amputation was performed at the middle third of the thigh; death ensued nine days after the operation, of pyæmia. The other five were treated after the manner suggested above, with no more favourable result.

CASE I.—Private Augustus Luce, 16th Maine, 20 years old, wounded Dec. 13, and admitted Dec. 19, 1862. Ball entered the inner side of right knee, breaking off the inner condyle of the femur, and passing out underneath the external condyle. In a few days after admission, evidence of suppurative inflammation being present, the patient was put under the influence of chloroform, and I opened the joint by a free incision on its outer side, letting out considerable pus and serum, and removed all the loose and comminuted bone.

Dec. 31. Has been quite comfortable since the operation, giving him best of diet, wine and iron, with constant cold irrigation.

Jan. 3, 1863. Still continues to do well; wound is suppurating freely and looks healthy; pulse soft and full; appetite tolerably good.

6*th*. Wound still healthy; pulse full; is cheerful; more or less infiltration of pus about the joint.

8*th*. Burrowing of pus between the muscles on the inner side of the thigh; tongue somewhat dry; pulse more feeble; hectic flush in the face; gave him tinct. ferri muriat., wine, and best of diet.

10*th*. Pulse very rapid and feeble; tongue dry; mind wandering a little; anorexia; suppuration very free, dissecting up the muscles of the calf and thigh in spite of every effort to prevent it by proper compress and bandages.

14*th*. Condition very much the same for the last four days: pulse 120 and feeble.

18*th*. Tongue not so dry; appetite better; pulse fuller, 100 per minute; wound still looks healthy; pus continues to burrow freely between the muscles of the thigh.

19*th*. Not so well this morning; pulse thready and rapid; has had a chill; complains of great thirst; wants nothing but cold water; pupils contracted; pus from wound dark coloured and fetid.

20*th*. Pulse about as yesterday; countenance looks pinched; very restless; pupils still contracted; toes and foot of wounded limb dark purple; pus from wound dark and very fetid; complete anorexia. Have been giving him strong stimulants, and whatever of food he would take.

21*st*. Pulse scarcely perceptible; muttering delirium. Died, exhausted, 5 o'clock P. M.

Post-mortem 20 *hours after death*.—Found the outer side of the external condyle of the femur, under side of the patella, anterior part of the spongy head of the tibia, the entire articulating surface of the tibia with the femur, all necrosed and of a dark colour; muscles of the calf and thigh dissected up and infiltrated with fetid pus.

The two following cases were in the ward of Act. Asst. Surg. G. F. French, who has kindly furnished me with the following notes:—

CASE II.—Pr. Wm. C. Fay, 11th Pa., wounded Dec. 13, admitted Dec. 19, 1862. Ball entered the external side of the spongy head of the tibia of the left leg, about a quarter of an inch below the articulation, and remained in the bone.

Dec. 27. Cautious incision for the ball; hole small—must have been made by buckshot; ball could not be felt.

29*th.* Inflammation and tenderness about knee beginning; veins red, not blue; cold irrigation constantly applied.

30*th.* Inflammation increased; veins enlarged and blue.

31*st.* Knee-joint involved; full of pus; free incision made and ball extracted from spongy head of tibia.

Jan. 1. Pulse 150; great dyspnœa; wound not suppurating well; looks red, and a purplish blue all over the knee; complexion very sallow. Night. Pulse small and rapid; complexion yellow as gold.

3*d.* Pulse rapid and feeble; wound dry, livid and yellow; pus from it abnormally yellow. Died at midnight.

Post-mortem 12 *hours after death.*—Infiltration of abnormally yellow pus for four inches above the knee on the upper side; periosteum destroyed on the inner and outer edge of the articulating surface of the femur; otherwise the periosteum and articular cartilages perfectly healthy. Entire articulating surface of the tibia healthy, except a narrow border on the external side, at which point incipient necrosis was manifest; head of the fibula not in the least involved, either primarily or secondarily. There is a hole in the head of the tibia, made by extracting the ball, about the size of a minie ball. The adipose tissue throughout the body of a golden yellow. Left ventricle of heart hypertrophied; one of the valves of the aorta obstructed by a fibro-cretaceous deposit. Right lung healthy; yellow fibrous and curdy deposit over the surface of left lung; small abscesses throughout the lower lobe of left lung; parenchyma of left lung in state of red hepatization. The rapidity with which the whole body became jaundiced was truly remarkable; while the liver exhibited no sign of disease after death. The gall-bladder was empty. Urine of a deep yellow colour.

CASE III.—Pr. Joseph Tetlow, 23d New Jersey, wounded Dec. 13, admitted Dec. 19, 1863. Ball entered on outer side of the popliteal space of right leg, lodging on the under side of the internal condyle of the femur, from which place it was extracted by Dr. French.

Dec. 23. High constitutional fever; there is great pain and swelling about the joint.

29*th.* Free incision into joint let out a quart of pus; bandaged the leg.

30*th.* More comfortable; feverish; pulse feeble; had slight chill; complains of pain at pit of stomach.

Jan. 2. Pulse very feeble and slow; hectic flush. Died in the afternoon of this day.

Post-mortem.—External condyle bared of periosteum; joint full of pus; external portion of articular surface of tibia bared also; muscles of the lower third of femur dissected up by the pus; periosteum off on the inner side and end of internal condyle; bone beginning to necrose; heart, lungs, and liver healthy.

Remarks.—There were two other cases under the care of Acting Asst. Surg. O. F. Sheldt, the notes of which were not kept. Both terminated fatally under the same general treatment. To an inexperienced surgeon it would seem impossible that cases presenting so little mutilation as these did when they were received in the hospital, would prove so inevitably fatal—and in these days of conservative surgery the temptation is very

great to make an effort to save the limb. Yet the result in these five consecutive cases, under the most favourable circumstances, adds but another proof to what has long ago been recorded by Guthrie, Ballingall, Larrey, Macleod, and many other writers on military surgery, that the only hope for any one, when the knee-joint has been opened by a gunshot wound, is in immediate amputation. Had these cases been amputated on the field, instead of sending them to the general hospital, there is every reason to believe that three out of the five might have been saved.

ART. V.—*Remarkable Case of Vesical and Urethral Calculi, in a Boy Twelve Years old. Forty-five Stones successfully removed from the Bladder.* By J. F. SANFORD, M. D., of Keokuk, Iowa. With three Woodcuts.

WILLIAM ELLIOTT, aged twelve years, applied to me for surgical treatment, December 13, 1862. I obtained the following history of the case from his father:—

He is a native of Pasquotank County, North Carolina. His figure is slight and his constitution much impaired by frequent attacks of illness. During infancy he suffered from protracted cholera infantum, which continued, more or less, till he was three years old. At that age, or a little later, he was attacked with hooping cough, which continued through an entire winter, attended with symptoms of unusual severity. This disease brought on repeated and copious hemorrhages from the lungs, and, when it subsided in the spring, left him much emaciated. During the succeeding summer, and before his health was entirely restored, symptoms of stone in the bladder made their appearance, causing considerable pain and slight straining in urination; at the same time obstruction to the free flow of the water occurred, which sometimes required energetic treatment for its removal.

These paroxysms occurred about once a week with but little variation in their severity until the spring of 1857. At this time they became much more painful and occurred more frequently. Incontinence of urine was now added to the sufferings of the patient, and every effort at micturition occasioned distress. In 1858 he had an attack of measles. This increased the pre-existing morbid condition and rendered the boy's agony almost insupportable. Some time in August last—1862—inflammation was developed in the perineum, attended with the usual symptoms of pain, swelling, &c., which continued with unabated severity—involving the scrotum and neighbouring parts—until suppuration and ulceration resulted establishing the condition of fistula in perineo. At one time during the greatest intensity of this local condition, when extravasation of urine into the cellular tissue had occurred, the inflammatory tumefaction exceeded an orange in size, and threatened extensive gangrene and sloughing of the parts. This finally subsided under treatment to the size of a walnut, the

surface presenting five or six perforations, through which the urine constantly dribbled. During the height of the local inflammation, the constitutional symptoms were very severe, and for some weeks the patient's life was despaired of. After it partially subsided he remained very weak and irritable, and the symptoms of stone in the bladder, before detailed, were much aggravated.

The history of the case above given will enable the reader to appreciate the condition of the patient at the time of his arrival in the city in search of relief. His emaciation was extreme and his sufferings indescribable. When I first saw him lying on his bed, I supposed it was some one suffering the intense pain of a recent injury. The head was bent down nearly to the knees, which were grasped by the hands, and the countenance, pale and thin, was expressive of the utmost agony. The intensity of the pain intermitted every five or ten minutes, not to be followed by ease or rest, but only to a degree more endurable by the patient; but I do not think during that day, or for several days after, whilst under my immediate observation, he passed an hour at any one time free from severe pain.

The case being thus attended with such extreme suffering, and otherwise presenting many points of more than ordinary interest, I allowed his father, who accompanied him, to prepare an upper room in my building for his reception, where I could have him under my hourly notice. The day after his arrival I made an inspection of the external parts, and found them presenting the following appearance:—

The prepuce, elongated at least an inch beyond the glans, was slightly red and tumefied; the lower part of the scrotum was enlarged and indurated, and below it, about half an inch, was a regularly circumscribed tumour, an inch in diameter, and elevated three-quarters of an inch above the surrounding surface. This tumour was inflamed and irritable, and perforated with five small openings, through which the urine would pass in small jets during each paroxysm of pain. A small portion of urine would also occasionally pass out through the natural channel. Still below this tumour the parts—that is, the perineum between it and the anus—were swollen and tender, a condition much aggravated during the straining pain which occurred so frequently.

Notwithstanding the local inflammation had greatly subsided, and consequently the fever had measurably passed away, the system was extremely irritable. The pulse during the week before the operation was seldom found below 120, the skin was hot and dry, the tongue coated, the thirst considerable, and the appetite weak and capricious.

Under these circumstances the sounding was postponed until the third day after the patient's arrival, and in the meantime his bowels were opened by gentle laxatives, mucilaginous and slightly alkaline drinks enjoined, and a few hours before he was sounded eight grains of Dover's powder were given.

This course having allayed to some extent the irritable condition, I proceeded in the presence and with the assistance of Drs. Whinnery, of Fort Madison, and Sala, of West Point, to sound him. The sound, a No. 8 steel bougie, was passed with some difficulty along the urethra into the bladder, encountering in its way two stones—one at the point of the perineal tumour above described, and the other three-fourths of an inch beyond. The instrument passed these calculi readily, but impinged closely upon their surfaces. The space intermediate between them, as also the urethra between the second stone and neck of the bladder, appeared to be

contracted, and opposed an obstacle to the onward progress of the sound. This contraction appeared greatest in the prostatic portion of the urethra, and for some time it seemed impossible to reach and enter the bladder. When by gentle perseverance this was accomplished, the nature of the case became obvious, and nothing remained but to prepare the patient for the necessary operation. This was done by putting him on a light, but nutritious diet, keeping the bowels open with mild laxatives, and enjoining mucilaginous and slightly alkaline drinks.

Operation.—The patient came to me December 13th, 1862, and by the 20th I considered him sufficiently prepared for the operation of lithotomy. On the evening of the 19th he took a dose of castor oil, and on the morning of the 20th the rectum was well emptied by tepid water injection. Having prepared means to meet the exigencies of a complex and difficult operation, I proceeded to its execution on the day stated, in the presence of several medical gentlemen and students, but particularly assisted by Dr. E. M. Sala, of West Point. The incision was made as usual in the performance of the lateral operation, except that it was begun a little higher, in order to approach the seat of the fistulous openings as nearly as possible, so as to facilitate the removal of the urethral calculus there located. On reaching the staff, it was found considerably to the right of the raphé or middle line, having been so deflected by the large urethral stone. I could not perceive at this point the ordinary circumscribed tissue of the urethra, but only a general expansion of all the tissues, forming a cavity in which it now appeared, a large calculus was lodged. Ascertaining by the finger and probe the dimensions of the stone, the cavity was opened to the extent of an inch upon the staff, which was then withdrawn. The forceps were now applied as well as possible to the calculus and an attempt made to extract it; but after repeated trials it appeared impossible to accomplish it in this way. It seemed to be so firmly impacted that the forceps could not grasp it with sufficient firmness; they would slip off, fracturing the external layer, but leaving the main body of the stone unmoved. I now took a steel gouge, slightly curved at the cutting end, and carefully insinuating it alternately around either side of the stone, succeeded at last in dislodging it from its bed. Its location was at the proper site of the membranous portion of the urethra, but we could trace no vestige of the normal structure; the cavity extended from the anterior margin of the prostate gland to the bulb of the urethra, and to the extent of half an inch or more on either side of the median line. Beyond this cavity the urethra, that is the prostatic portion, seemed to be less than the usual size, and, as far as I could see, this contraction embraced its entire extent.

I now passed a small silver female catheter into the bladder to be used as a sound, and found that organ literally crowded with stones, the grating upon the instrument and upon one another as they were moved about by it, being quite audible. It was now necessary to extend the incision, and to accomplish this a straight staff was introduced, into the groove of which the point of a beaked scalpel was placed and pushed, properly lateralized, through the prostate into the bladder. Through this incision, after dilatation with the finger, the forceps were passed, and one after another several of the larger stones removed. The scoop was then substituted and the bladder emptied of its contents, with the exception of a considerable quantity of debris lying in the *bas fond*, and some gritty and scaly matter adhering to the walls. After clearing this latter from the mucous membrane

with the finger passed in every direction around the cavity, it was thoroughly washed out by repeated and forcible injections of warm water. After a careful examination of the spongy portion of the urethra, the operation was considered complete. It was done in less than fifteen minutes, the patient being under the full influence of chloroform and unconscious of any suffering during the entire period thus occupied. It was the opinion of all present that less than an ounce of blood was lost during the operation. The patient rested well during the day and night following, being entirely free from pain, and enjoying a night's calm repose, to which, for years, he had been a stranger. No febrile reaction occurred, not the slightest inflammatory action manifested itself in the pelvic or abdominal viscera, and in fact we may say, without noting a single exception, that the patient rapidly recovered without an unfavourable symptom.

At the end of two weeks, the wound being nearly closed, we deemed it expedient to introduce and retain a silver catheter. The alteration of the tissues produced by long continued disease and the presence of foreign bodies in the urethra, endangered its occlusion in a considerable portion of its extent during the process of union and repair, and this, together with the yet unclosed condition of the fistulous openings near the scrotum, rendered the use of a catheter necessary. There were circumstances connected with the morbid condition at the seat of these fistulæ, that precluded the probability of their cure, even by the use of this instrument. There were several openings; they had been protracted and obstinate, and lastly, the internal opening was very large. I therefore determined to lay open the parts by an external incision and heal them over the silver catheter. This was accordingly done, the incision being made upon a staff. In carrying the knife through the parts it was evident that a calculus was imbedded in the swollen and indurated parts external to the urethra. Its situation entirely outside of that canal, caused us to miss it in our search for more stones after the operation was deemed complete. Not being prepared at the moment of its discovery to extend the operation and remove it, that proceeding was postponed and the wound dressed. In removing the dressings subsequently the stone came away with them. It is of the size and shape represented by Fig. 1.

The swelling and redness now rapidly subsided, and in the course of a few days the wound had closed with the exception of a small orifice not larger than a pin's head. The patient's general health in the meantime rapidly improved, and he left for home on Tuesday, Jan. 20th, 1863.

Owing to the strongly marked diathesis and tendency to relapse existing in this case, the patient was put upon the occasional use of nitric acid, a daily cool bath directed, and a plain nutritious diet and exercise in the open air enjoined.

Number and composition of the stones.—It was our impression at the time the stones were being removed that they did not number more than eight or ten. Their softness, friability, and covering of mucus and blood, prevented a correct estimate of their number, and created the impression that they were broken into numerous fragments by contact with the instruments during extraction. But after being cleansed in the most careful manner, they were closely scrutinized and counted in the presence of Drs. Sala and Pittman, and every one not presenting an entire unbroken surface was excluded. There were 47 of these distinct calculi, and of those showing more or less of a fractured surface, over 100. They are of every shape and

obscurely laminated. The largest perfect stone is the one which was imbedded in the membranous portion of the urethra, the size and form of which is here shown (Fig. 2).

Fig. 1.

Fig. 2.

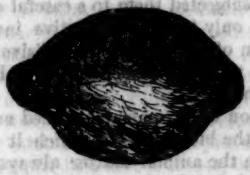


Fig. 1.—Actual size and shape of small Urethral Stone located in *cul-de-sac* at spongy portion of the Urethra.
Fig. 2.—Large stone located in the membranous portion of the Urethra.

This stone measures three inches and three-quarters in its long, and three inches in its short circumference. The largest vesical calculus is two inches and a half in circumference—the smallest about the size of a pea. The aggregate mass of the fragmentary portions would exceed in bulk the larger urethral stone. The aggregate weight is within a small fraction of two ounces. The mass thus described filled the bladder, which was closely contracted around it, and forcing, by its spasmodic action, the stones into the vesical triangle and neck, thus arresting the function of the *sphincter vesicæ*, and causing the leaking and dribbling of urine before alluded to. The following illustration is designed to represent this condition :—

Fig. 3.

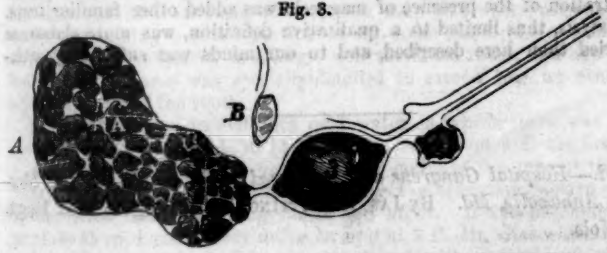


Fig. 3.—Showing Bladder, Urethra, &c. *A.*—Bladder full of stones. *B.*—Pubic Bone. 4.—Small Urethral Stone. 5.—Large stone in membranous portion of the Urethra. Between the neck of the bladder and the large stone is seen the prostatic portion of the Urethra, contracted by disease and structural change.

It may well be imagined that a bladder thus situated, and subject for years to the presence of foreign bodies provoking irregular and spasmodic action, would become the seat of morbid alterations of form and structure. Such alterations were quite obvious in this case. The form of the organ was elongated and contracted slightly in the middle, as above represented, whilst there was an irregular thickening of the coats, as is sometimes apparent from hypertrophy of the muscular fibres. This was so great in some portions of the organ as to resemble the retiform arrangement existing in columniform bladder.

From the appearance and obvious character of these stones, we had but little doubt as to their chemical composition. They were pale coloured, of

earthy texture, smooth and soft. A section of any particular stone exhibited a uniformity throughout the mass. From these indications we believed them to be composed of the triple phosphate of ammonia, magnesia, and lime, but as, in a case of so much importance, it was desirable to establish the fact of their composition as clearly as our means would allow, we subjected them to a careful analysis. This process had reference, of course, only to the qualitative investigation, but the experiments and application of the tests were decisive and satisfactory. The following is briefly the method pursued in which I had the assistance of my pupil, Mr. J. A. Webster:—

A portion of the calculus placed on platinum wire was subjected to the action of the blow-pipe, by which it was speedily blackened. This result was due to the animal matter always present in earthy calculi. It then became white, and by continued action of the flame was imperfectly fused into a kind of vitreous grit. During the process a distinct ammoniacal odour was exhaled. A portion of the incinerated mass was then dissolved in chemically pure nitric acid diluted, and this solution divided into two parts. One part was taken, and after neutralizing the excess of acid by a solution of the bicarbonate of potash, it was tested with a strong solution of nitrate of silver, which produced a beautiful yellow precipitate. This precipitate was phosphate of silver, and thus demonstrated the presence of phosphoric acid. The second part of the solution was *nearly* neutralized with ammonia; to this a solution of oxalate of ammonia was added, which after a short interval produced a white crystalline deposit. This precipitate was the oxalate of lime. After it had entirely subsided, the clear liquid was poured off, and this liquid, when tested with caustic ammonia, produced a crystalline precipitate of triple phosphate. To this demonstration of the presence of magnesia was added other familiar tests. This analysis, thus limited to a qualitative definition, was more elaborate and varied than here described, and to our minds was sufficiently satisfactory.

ART. VI.—*Hospital Gangrene as it appeared in St. John's College Hospital, Annapolis, Md.* By JAS. W. PITTINOS, Asst. Surgeon 67th Regt. Pa. Vols.

ON the morning of Jan. 11th, the steamer New York arrived at this port, bringing a large number of sick and wounded from Richmond, Va., the majority of whom were wounded at Fredericksburg, Dec. 13th, 1862, and had been treated in the Libby Prison Hospital.

At the time of their admission into this hospital, the wounds presented no unusual appearance, with the exception of those of Henry Larke, of whom I shall speak presently. Our hospital has had every attention bestowed upon it to prevent the origin of any disease, which is produced by filth, bad ventilation, &c., and from what I have learned since, I am satisfied that the disease was brought from Richmond in the New York, as I have been informed by an intelligent officer that it prevailed there to a considerable extent, and that many had died.

CASE 1. The first person in whom it appeared, was Henry Larke, Co. G, 8th Pa. Reserve Corps. This young man was eighteen years of age, delicately framed, and had a gunshot fracture of the radius of the left arm. He was the only person whose wound did not appear healthy. On the 12th I noticed the disposition of the wound to slough, and applied nitric acid diluted with an equal quantity of water. This treatment was continued until the 14th, without effect; the disease continued to spread. On the 15th, the pure acid was applied to the diseased surface, and around the wound on the healthy skin. This was followed by a poultice, composed of one part by weight of powdered charcoal and three of cornmeal, made of the proper consistency with fresh yeast, which was renewed every five hours. His pulse was 130 per minute, tongue clean, skin cool, and bowels regular; his food consisted of roast beef and potatoes, beef-tea, soft boiled eggs, farina cooked in milk, rice, egg custard, and a pint of porter daily.

The disease first attacked the point of entrance of the ball and subsequently the point of exit, and soon involved the muscles of the anterior and posterior parts of the forearm. The fetor was very great, and the wound assumed an oval form. The wound continued to get worse until the 29th, notwithstanding all my efforts to stop the progress of the gangrene, and as amputation seemed to offer the only prospect of saving his life, I performed the flap operation midway between the elbow and shoulder joints on the 30th, assisted by Act. Asst. Surgeons K. O. Crane and Radcliffe, U. S. A. The inflammation had extended as far as the elbow, and the forearm was enormously enlarged and livid. He took immediately after the operation fifty drops of laudanum and two ounces of whiskey. Every precaution was taken to prevent the disease attacking the stump. He was washed from head to foot with soap and water, afterwards with water containing a small portion of liq. sodæ chlor.; he was dressed in new clothes and placed in a large, well ventilated room, in a new bed and bedding. A nurse was specially detailed to attend him, no other being allowed to enter the room.

The wound was dressed with cold water, in which there was a tablespoonful of liq. sodæ chlor. to the quart. He slept well the first night, was cheerful next day, and has continued so up to the present time. He took a pint of porter the day following the operation, also a grain of opium three times—morning, noon, and night. If the last pill did not produce sleep, I gave thirty drops tr. opii at 9 P. M., after which he rested well. On the 3d of Feb. he was seized with nausea and vomiting, which yielded to a hard opium pill every two hours and dry treatment, that is, no fluids were given him. He continued cheerful and to improve until the 11th, at which time the stump began to swell and assume a threatening appearance; it was enveloped in a large flaxseed poultice, and on the 12th discharged a large amount of healthy pus. The poultice was continued until the 14th, when the inflammation subsided, since which time it has been dressed with tepid water and the patient has continued to improve up to the present time, Feb. 28th, and is in a fair way to recover. His food has been the same after the operation as before it; the stump has nearly healed; all the ligatures have not come away as yet. He is walking about his room, and will get well. March 3d.

CASE 2. E. Nicholas, Co. E, 94th N. Y. Vols., aged 21 years, was admitted on the 11th Jan., 1863, was wounded at the same place and same date as Larke, arrived in the New York, had a gunshot wound of

the right side of the thorax and right side of the head. Wounds presented the ordinary appearance they do a month after their reception. Gangrene attacked the wound of the thorax on the 14th Jan. Nitric acid was applied to the wound and around the edges on the sound skin, the poultice of charcoal, meal and yeast was applied and renewed every five hours. He took a grain of opium three times a day, also half a pint of porter twice daily; his food consisted of beef-tea, chicken broth, farina with milk, rice, custard, &c. He also took a half fluid drachm of fld. ext. cinchonæ thrice daily. The gangrenous spot was oval, three and a half inches long by two and a half wide, and emitted an intolerable stench. The constitutional disturbance was very slight, tongue clean, skin cool, pulse 90, bowels rather constipated, and very little appetite. He was of a lymphatic temperament. Dr. Stovell, Act. Asst. Surgeon U. S. A., having been deputed to take charge of all the gangrenous cases, he was transferred to the Naval Academy Hospital, Feb. 7th, 1863. I learn he has since died. He was confined in the Libby Prison Hospital, as were all the patients who were admitted into this hospital with wounds 11th Jan. 1863. The disease was progressing unfavourably, when he was transferred from my wards.

CASE 3. Theodore Bixler, Co. F, 11th Pa. Reserve Corps, aged 19 years, lymphatic temperament, was admitted precisely under the same circumstances as Nichols. He had a gunshot wound of the right side of the thorax. Gangrene appeared on the 14th of Jan.; it advanced in its course until the wound was two and a half inches long by one and a half broad, at the point of exit, and there was a circular patch an inch in diameter at the point of entrance. The same treatment was pursued in this case as in the others, with the exception that tr. iodinii was applied to the diseased surface, as it began to assume a healthy aspect, and with a decided benefit to the patient.

Feb. 4. The wound is healthy, and the patient evidently gaining flesh; is dressed with sol. argenti nit., four grains to the ounce.

24*th.* Granulations have filled up the wound, and it is cicatrizing; it is dressed with sol. argenti nit., ten grains to the ounce; no constitutional symptoms, and the patient will be well in a few days. The constitutional treatment was the same as in the above case.

CASE 4. W. H. H. Baily, Co. F, 38th N. Y. Vols., aged 20 years, lymphatic temperament, was wounded at the same battle, and was received under the same circumstances as the above-named. He had a gunshot wound of the shoulder, the ball passing, or rather grazing, the upper edge of the pectoralis major muscle, about an inch and a half from its insertion into the anterior ridge of the bicipital groove of the os humeri, and coming out at the outer edge of the scapula. The wound was to all appearances healthy when admitted. Gangrene appeared on the 15th of Jan.; the tissues instead of detaching themselves in brown or black sloughs, melted into a thick, light gray grumous matter. The constitutional symptoms were of a typhoid character. The tongue was dry, brown, and cracked, pulse varied from 120 to 130 per minute, and very feeble; no appetite; bowels irregular, sometimes loose, at other times constipated; restless at night. The local and constitutional treatment were the same as in the above cases.

Feb. 1. The wound has sloughed to such an extent as to expose the upper and outer portion of the great pectoral muscle to such a degree, that the pulsation of the brachial artery can be distinctly seen, and the point of exit, which was entirely healed, had opened, and as the man lay on his back

the matter was discharged through this opening; the wound was three inches in diameter.

3*d*. I ordered the wound to be dressed with scraped lint saturated with a solution of nitrate of silver, thirty grains to the ounce, and on the 5th the wound had assumed a more healthy appearance. On the 6th he was transferred to the Naval Academy Hospital much improved. He is now, I believe, in a fair way to recover.

CASE 5. E. M. Curry, Co. H, 1st Pa. Reserve Corps, aged 25 years, was received with the above-named patients. He was wounded in the right forearm. Gangrene appeared on the 16th January, and spread until the tissues sloughed to the extent of two inches long by one and a half broad. He had nitric acid applied, followed by charcoal and meal poultice. On the 1st Feb., the wound was much improved, and tr. iodinii was applied with advantage to it. He had no constitutional irritation, tongue clean, pulse natural, bowels regular; his food and medicine were the same as in the above cases.

28*th*. The man is nearly well.

CASE 6. Chas. Booyer, Co. H, 1st Pa. R. C., aged 22 years, was admitted the same date from the same source, with gunshot wound of the left forearm. Gangrene attacked the wound on the 16th Jan. He was treated precisely as the last-named, and continued to improve until the 17th Feb.; then gangrene attacked the wound with more violence, and the skin and subcutaneous tissues sloughed to the extent of two inches. The gangrenous spot was circular. As the pain was severe, and the slough, which had not separated, was of a spongy character, I made a crucical incision which afforded the man immediate relief.

21*st*. Not much improvement. Patient has no appetite; does not sleep well. I ordered him tr. ferri chlor. gtt. xxv., quin. sulph. gr. i, three times daily, with tr. opii gtt. xxx. at bedtime.

25*th*. Patient better, appetite improved; this man complains of more pain than any of the others.

28*th*. Still improves; he has had no constitutional irritation; his tongue was clean, pulse regular, and of sanguine temperament. He will recover.

CASE 7. N. Richards, Co. A, 94th N. Y. Vols., aged 21 years, was admitted the same date as the others, received from the same source, had a gunshot wound of the left thigh. Gangrene made its appearance on the 16th Jan.; tongue clean, bowels regular, appetite good, pulse natural, and slept well. Applications of nitric acid and poultice produced the desired effect. The wound speedily assumed a healthy appearance, granulated, and is now, Feb. 28th, cicatrizing. The wound was oval, and one inch and a half long by an inch wide. It was a slight case.

CASE 8. Chas. Housman, Co. B, 121st Pa. Vols., aged 33 years, was admitted on the same day as the above-named patients, had a gunshot wound of the right shoulder. Gangrene attacked the wound Jan. 15th; the disease progressed rapidly until the 1st of Feb., at which time the deltoid muscle was exposed in front to the extent of four inches, and one inch behind; the gangrenous patches were circular, and had the peculiar offensive odour. This was one of the worst cases in my ward. The patient was a stout, healthy man, with a cheerful disposition, pulse regular, tongue clean, bowels regular, good appetite, and slept well. He was treated with nitric acid and poultice with the most beneficial results. On the 4th of Feb., the dis-

cased surface had assumed a healthy appearance, and suppuration and granulation went on favourably until Feb. 20th, at which time he was transferred to Philadelphia. During the last week of his treatment the wound was dressed with sol. argenti nit., thirty grains to the ounce. He was to all intents and purposes well when he left; constitutional treatment was the same as in the other cases.

CASE 9. James B. Kent, Co. B, 19th Mass. Vols., aged 46 years, lymphatic temperament, wounded at Fredericksburg in the right popliteal space, admitted the same date from the New York. Wound was nearly healed when he arrived. Gangrene made its appearance Jan. 26th, and spread rapidly until the gangrenous patch was four inches in diameter. Nitric acid and the poultice steadily applied overcame the disease, and on Feb. 4th the character of it had altered very much.

6th. He was transferred to Naval Academy Hospital in a fair way to recover. He had but little constitutional irritation.

CASE 10. William Ham, Co. E., 5th Pa. R. Corps, aged 28 years, was admitted from the New York, on the same date with a gunshot wound of the left leg, fracturing the spine of the tibia. Gangrene appeared January 15th, soon destroying the tissues to the extent of three inches in diameter and exposing the anterior tibial group of muscles, also destroying the cellular tissue between them. The treatment was the same as in the above case, with the exception that on the third day I substituted tr. ferri chlor. for nitric acid and continued it until 20th; it had no beneficial effect. Nitric acid was again applied until 25th, when the disease changed for the better.

26th. Was painted with tr. iodinii three times daily and poultice continued. He improved until the 6th February, when he was transferred to the Naval Academy Hospital. He had no constitutional irritation.

CASE 11. M. S. Dunn, Co. K., 1st Pa. R. Corps, aged 23 years, was admitted Jan. 11th, from the New York, with a gunshot wound of the posterior portion of the thorax; the ball entered the left side at the inferior angle of the scapula and came out near the same place on the right side. Gangrene appeared at the exit of the wound on the 14th and at the entrance two days after. The parts at the exit sloughed to the extent of four inches in diameter and at the entrance half that space.

Feb. 10. The application of nitric acid and poultice with the same constitutional treatment, has destroyed the specific character of the diseased parts, and he is rapidly recovering.

15th. Wound perfectly healthy; it is dressed with sol. argenti nit., 10 grains to the ounce.

27th. Wound cicatrizing rapidly, treatment continued. Although this was one of the worst cases, there was not the slightest constitutional irritation.

CASE 12. J. T. Gibson, Sergeant Co. A., 25th N. Y. Vols., aged 28 years, admitted the same date as the others from the New York, had a gunshot wound of the forearm, fracturing the lower third of the ulna. Gangrene attacked the wound Jan. 16th; the same treatment was pursued as in the other cases.

Feb. 6. He was transferred to Naval Academy Hospital in a fair way to get well. No constitutional disturbance.

CASE 13. Aaron Bush, Co. G., 10th Pa. R. Corps, aged 23 years, admitted the same date, and from the same boat, with a gunshot wound of

the right side of the thorax. Gangrene attacked the point of exit Feb. 2d, and spread rapidly, destroying the tissues for a space of two and a half inches long by one and a half broad.

Feb. 12. Disease has yielded to application of nitric acid and poultice.

20*th.* Wound perfectly healthy, dressed with sol. argenti nit., 10 grains to the ounce.

28*th.* Wound cicatrizing and will soon be well.

CASE 14. Geo. F. Knowlton, Co. F., 4th Maine Vols., aged 24 years, was admitted Jan. 11th, from the steamer New York, with two gunshot wounds of the right side of the body; one ball entered two inches above the crest of the ilium and passed out two inches from the spinal column opposite the second lumbar vertebra, the other three inches above the first, and passed out four inches from the spine; the course of the latter ball was parallel with the former. Gangrene, which was of a mild form, attacked the wound Feb. 12th, and destroyed the skin and subcutaneous tissues for an inch and a half, also burrowed to a considerable extent, discharging a thick, grumous matter, like Baily (Case 4th). Nitric acid and poultice were applied with marked effect.

25*th* The wound discharges less freely; that part of it, with which the poultice comes in contact, is healthy; injected with sol. argenti nit., 30 grains to the ounce.

March 2. Wound nearly well, patient will recover; no constitutional disturbance.

CASE 15. Henry M. Wick, Sergeant Co. A., 8th Pa. R. Corps, aged 23 years, was admitted into this hospital from the Naval Academy Hospital Sept. 15th, 1862, with a gunshot fracture of ilium near the crest.

Nov. 28. I cut down upon the bone and extracted a piece of it, necrosed, about the size of a small hazel-nut. The incision healed by first intention; the wound was granulating rapidly, when it was attacked by gangrene.

Feb. 3. The cicatrix of the wound was destroyed in forty-eight hours; the incision opened from one end to the other and became deeply excavated. Nitric acid and poultice speedily restored it to a healthy condition.

20*th.* Applied solid nitrate of silver.

March 2. Patient nearly well; no doubt of his recovery. This was the only man who had gangrene and did not come in the New York, Jan. 11th, 1863.

Remarks.—That the disease was brought from Richmond I have not the slightest doubt; the want of proper space, medicine, and disinfectants, to treat a large number of wounded, would be a prolific source from which we might expect a disease of this nature, to say nothing of overcrowded and badly ventilated wards. It no doubt was concealed as long as possible in Richmond, but is now well known there. Our officers bring accounts of it, and no doubt the cargo of the New York was the first souvenir we received from the rebel hospitals.

There were evidently two varieties of it, that in which the tissues melted rapidly into a light gray grumous matter, which would be found in the bottom of the wound; and the other in which the tissues were converted into a brown or black dry slough, which required in some instances to be

dug out with a blunt instrument. This had to be done invariably before the application of the acid.

This gangrene was, in the majority of cases, of a mild form, and though it presented all local symptoms of the disease as described by Hennen, yet the constitutional were, as a rule, absent. The wounds were dry and hot and the limbs were much congested when it existed in them. The edges were swollen and everted, and sanies issued from them when the wound was of the black or brown variety. The first indications of improvement were alteration in the character of the discharged fluid, a disposition of the sanies to assume qualities of healthy pus, and the wound to become moist; these may be looked upon as invariably favourable. If these men had been crowded together in badly ventilated wards and nurtured by filth and food of a bad quality and insufficient in quantity, I have no doubt but that it would have assumed all the malignant symptoms of the disease as described by the above named writer. Every precaution was taken to prevent the spread of it from patient to patient; as soon as it made its appearance in a wound, the patient was immediately removed and placed in a room where there were no wounded. As I had many sick I placed these men in rooms with them, one to each room; those with healthy wounds were removed to another building; although I was obliged, for want of room, to retain many wounded in the same building with those infected, the gangrenous patients produced no bad effect upon the others. Each man had a separate sponge, basin, &c.; one nurse was detailed in each ward to dress the wounds of gangrenous patients, and he allowed to dress no others; the bedclothes were washed separately, and whitewashing the room was frequently and thoroughly done. The constitutional treatment was never lost sight of, roast beef and potatoes, beef-tea, chicken broth, eggs, milk, rice, much porter, bark, and opium were given freely with the most decided advantage. Those who were attacked last had it in its mildest form, and though wounds of some patients were disposed to assume an unhealthy character at first, they are at present all doing well; the gangrene may be looked upon as a disease that was, and the patients now all have healthy wounds.

ART. VII.—*Report of Cases of Hospital Gangrene, treated at St. John's College Hospital, Annapolis, Md.* By Act. Asst. Surgeon H. O. CRANE.

CASE 1. Herman Tiarnor, private of Company F, 32d Indiana Volunteers, wounded at Murfreesborough, Tenn., Dec. 31, 1862, by a minie-ball passing through the latissimus dorsi of left side, over and exterior to the eighth rib, entering posteriorly. Patient was twenty-seven days in Libby Prison at Richmond, Va.; arrived here per steamer New York and was admitted Jan. 29, 1863, at which time the wound at the exit of the

ball was in a sloughing condition, and within twenty-four hours thereafter manifested all the symptoms of hospital gangrene. Constitutional symptoms present. Headache, nausea, quick pulse (130). Hot skin, with occasional rigors. Nitric acid was applied to the surface of the wound, and subsequently poultices of charcoal and yeast with chlorinated washes, and dressed twice each day with tinct. ferri chloridi.

Feb. 5. Ulcer looking more healthy; sloughing has ceased; dressings, solution of tannin, gr. xx, aqua ℥j; poultices continued. Constitutional treatment, sesquioxidi ferri, quiniæ sulphas, bark, porter, beef-tea, and nourishing diet.

20*th.* Patient improving and treatment continued.

28*th.* Patient now well.

In the above case, the constitutional symptoms had preceded the unhealthy condition of the wound, though the application of the fuming acid arrested to a great extent the spread of the ulcer, yet the continued application of tinct. ferri chloridi was of marked benefit.

CASE 2. Private J. Loose, Company B, 5th U. S. Infantry, wounded at Murfreesborough, Tenn., Dec. 31, 1862, by a minie-ball passing through upper third of the tibialis anticus, and carrying away the spine of the tibia, having entered posteriorly. Patient arrived here from Richmond, Va., on the steamer New York, Jan. 29th, 1863, and was on that day admitted into this hospital. On admission, the wound was in a sloughing condition with extensive fetid discharges. Local treatment, constant application of lint saturated with tinct. ferri chloridi and free use of liq. sodæ chlor. injected into the wound.

Feb. 5. Sloughing arrested; granulations looking healthy. Local treatment continued. Constitutional treatment as in the above case.

18*th.* Patient still improving; treatment continued.

28*th.* Wound healed. The history of this case also shows that constitutional symptoms preceded the gangrenous condition of the wound.

CASE 3. Theodore Adams, private Company E, 21st Illinois Volunteers, wounded at Murfreesborough, Tenn., Dec. 31, 1862, by a musket-ball entering posterior portion of the deltoid muscle of the left arm, and traversing the trapezius muscle, making its exit near the spine. Patient arrived in steamer New York, Jan. 29, 1863, and was on that date admitted to this hospital. On admission, the wound looked well, though suppurating freely. Patient much debilitated, tongue dry, pulse 120 and quick, headache, diarrhœa and total loss of appetite. Ordered beef-tea, milk-punch, brandy-mixture, tinct. ferri chloridi gtt. xxv every four hours; also quiniæ sulphas, gr. iv every six hours, under which treatment the patient improved.

5*th.* Pulse one hundred, skin and tongue moist, and appetite returning. Condition of the wound the same.

8*th.* Constitutional symptoms the same, but the wound has become painful, and is commencing to slough; fetid discharges, &c. Applied poultices of charcoal and yeast with chlorinated washes.

10*th.* Sloughing continues; wound is injected with Labaraque's solution, full strength, repeated every six hours; poultice continued.

12*th.* Condition of the wound unimproved. Ordered dressings of tinct. ferri chloridi; poultice removed and liquor sodæ chlorinatæ applied.

14*th.* Wound commencing to granulate, discharge less profuse and more

healthy. Constitutional symptoms improved; continued dressings of tinct. ferri chloridi.

18*th*. Wound granulating freely; appetite good.

28*th*. Wound nearly healed, and patient will be well in a few days.

ART. VIII.—*Circumscribed Aneurism of the Walls of the Left Ventricle.* By PHILIP S. WALES, M. D., Surgeon U. S. N.

JOSEPH BROWN, ordinary seamen, age 25, born in Malaga, was admitted into the Hospital at Portsmouth, Va., Dec. 24, 1862, from the steamer Rhode Island. He was nearly comatose, and unable to speak or give any intelligible signs of his sufferings. The surgeon of his ship sent with him the following account of his case: "Admitted to my list Dec. 12, complaining of headache and pain in the back, with chills and cough. He improved and was discharged, Dec. 15. On the 20th of the same month again presented himself, having a cough and great difficulty in articulating properly. In the afternoon he had a chill, and another on the following day, at the same hour, succeeded by the usual phenomena of intermittent fever. Was put upon the use of the sulph. quini. During the morning of the 23d seemed comfortable; in the evening fell from his hammock convulsed, breathing short and hurried; pulse 102; semi-comatose." It is well to observe that the ship was in service in the James River, where malarial diseases are rife.

Immediately on his being made comfortable in bed, the following receipt was ordered: R.—Ammoniæ carb. gr. xx; whiskey fʒiij; vitell. ov.; sacchari albi ʒij; aquæ fʒij.—M. Quarta pars quâque duo horâ.

25*th*. No improvement; pupils contracted; conjunctivæ insensible, with mucous threads collected upon them and on the edges of the eyelids. The corneæ dull and glassy in appearance; pupils motionless and about as large as ordinarily; the right eye convergently, and the left divergently strabismic, and both well turned up under the lids. The face and lips of a dusky or bluish color. No heat of scalp, nor were any motions made by the patient to direct our attention to any suffering on his part in the head. Tongue covered with a thin yellowish coating; mouth moist, and when the medicine was placed into it, several seconds elapsed before deglutition commenced, unless it was thrust well back with a spoon. Towards the last he made attempts to eject the mixture with his tongue. Bowels obstinately constipated, and have resisted the free use of stimulating enemata and drastic purgations.

26*th*. Continues pretty much in same condition; occasionally, when spoken to loudly, stammers out "better," and when asked to do so, attempted

to protrude his tongue. Respiration 20; pulse 82, and normal in volume, with some increase of hardness. Coarse mucous râles can be heard over every part of the chest, before and behind. Healthy resonance on percussion. Cardiac dulness increased in its area, extending to the left side. Evening. Patient restless, tossing about in bed, throwing off the coverlids and keeping his limbs in constant motion. Passes his urine unconsciously, freely, and in larger quantities than normal, keeping the mattresses constantly saturated with that secretion. Skin soft and moist, and sometimes the perspiration stands out in large drops upon his forehead and chest. Applied counter-irritant to chest; enema of sulph. magnes., and continued the mixture of egg and whiskey.

28*th*. Has been failing; tongue brown, lips covered with black sordes; jactitation, facies hippocratica; death.

Post-mortem 14 *hours afterwards*.—Rigor mortis well developed, hypostatic congestion in back and hips. *Head*.—Strong adhesions between skull and dura mater; veins of pia mater gorged with blood. Two or three superficial patches of red softening on the cerebrum, and the gray substance of a few sulci yellow from purulent infiltration. Arachnitis with delicate threads of lymph in some places. The anterior and middle lobes of the cerebrum normal in appearance, posterior left lobe broken down by red softening and suppuration. Left lateral ventricle contained about three ounces serous fluid, with flakes of lymph enlacing with the choroid plexus, and partially covering its floor; right lateral ventricle healthy. Cerebellum entirely exempt from any pathological changes. Under pons varolii and medulla oblongata there was a purulent foyer, of about two or three drachms of pus between the layers of arachnoid. The sub-arachnoid spaces contained an unusual amount of serous fluid; spinal cord, natural firmness and structure. In many places the arachnoid was thickened and covered with easily lacerated filaments of fibrin. The volume of brain seemed reduced so that there was a considerable space between it and the calvaria. *Chest*.—The lungs were of a deep brownish-red colour everywhere, except at the anterior margins of the upper, right, and middle left lobes, which parts were healthy. They crepitated between the fingers; at few points lobular pneumonitis had occurred, and a section through the consolidated tissue presented all the physical characters of carnification. From cut surfaces, a frothy whitish fluid exuded—that from the larger divisions of the bronchial tubes was muco-purulent. In fact the usual pathological changes of acute bronchitis were observed. The pleuræ were perfectly healthy in appearance, and contained about it a half ounce of serous fluid. *Heart*.—While in situ, this organ appeared of enormous size, and, grasped in the hand, conveyed the impression of its being double. Slitting up the pericardium gave issue to about two ounces yellowish serum, and displayed the heart with its cordiform aneurism in such a striking manner, that the exclamation of some of the bystanders was, "The man has two hearts."

The coagula were removed from both, and the organ weighed 18 ounces Avoird. Adipose tissue covered in the external surface of both ventricles, except at their apices, the muscular fibres beneath presenting a pale waxy appearance, while those of the auricles were of a healthy reddish colour, and distinctly aggregated in strong bands. The pericardium adhered to the apical segment of the aneurism.

In the right ventricle yellowish filaments of fibrin entwined with the fleshy columns and the cords, and connected themselves with a large mass of the same material adherent to the columnæ carneæ. Loosely in its cavity were the almost black, post-mortem coagula. The tricuspid and pulmonary semilunar valves were perfectly healthy, and accurately shut their respective orifices. Cadaveric coagula were also found in the right and left auricles, but none of the yellowish deposit. The peculiar semi-organized yellow clots were found in the left ventricle, also adherent to the columnæ carneæ.

When the cavities of the heart were cleared of all these deposits, an incision was made from the left ventricle into the aneurism, exposing its cavity freely, and giving a good view of its mouth and the hypertrophied columnæ carneæ, which subtended it, dividing the area into an upper smaller segment, and a lower larger one.

The soft black cadaveric coagula were first turned out from its centre, then less dark granular matter, and lastly layer after layer of reddish-yellow, pinkish, or flesh-coloured fibrin was peeled out, like the laminæ of an onion can be separated after the removal of a section of it. It was distinctly organized; and close to the outer rind, I observed tender capillaries shooting into it. Outside of all this was a hard calcareous case forming a complete wall for the aneurism, except at its orifice and apex, where there were two round holes, the former 18 lines and the latter nearly an inch in diameter in the shell; there was also a bulging of the extreme point somewhat beyond the lower opening, making in this manner a small secondary cavity. This lining had the thickness of two lines nearly everywhere over its surface, and was perforated at numerous parts by small holes. In its physical appearance, it resembled closely thin plates of the dense cortical substance of the thigh bone; my microscope not being accessible, I am unable to give its minute structure. Outside of this was met the muscular structure of the heart, rather what was left, which only amounted to a thin layer of fibres, placed between the calcareous envelope and the pericardium, diminishing in thickness to the dilated apex that I have previously mentioned, where it ceased, the thickened pericardium forming with the fibrous clots the only boundary of the aneurism in this direction and corresponding to the lower opening of the inside crust. The thickness of these two layers permitted the rays of light to pass through them in such quantities, when the heart was held between the eye and the sun, as to constitute translucency. As I have said above, the heart was perfectly symmetrical, and

if the aneurismal tumour had been cut from it, through its somewhat narrowed neck, the organ would have been, pathologically, only concentrically hypertrophied and affected with fatty degeneration. The mitral and aortic semilunar valves, like their fellows on the opposite side, were in a normal condition, and performed their offices healthily. I took the following measurements of the left ventricle walls :—

	At the base	9 lines
	middle	8 "
	apex	5 "
Right Ventricle.	At origin of pulmonary artery	2 "
	lower down	3 "
	ventricular septum between 7 and 8	" everywhere.

Immediately under two of the aortic semilunar valves, and corresponding to that part of the left wall of the right ventricle against which the inner segment of the tricuspid valves lay, when open, the partition was diaphanous, and resembled exactly in structure and thickness the membranous diaphragm of the foramen ovale of the auricles.

Capacity of left ventricle	℥j.
" " right ventricle	little less.
" " right auricle little over	fʒj.
" " left auricle little under	fʒj.

The aneurismal pouch cleared out, as I have said, held exactly 4 ounces of alcohol.

In regard to the walls of this cavity, I have already stated that at the point of it, the pericardium alone formed its wall. From this place the muscular tissue increased in thickness towards the base of the tumour, where it had attained six lines close to the margin of the ventricular orifice, which was surrounded by a strong fibro-cartilaginous ring seated about the middle of the left cardiac margin (*margo obtusus*) and a section of it presented a triangular shape with its base outwards, and the two angles continuous either way with the parietes of the ventricle on the one hand, and that of the sac on the other, its apex bounding the orifice with a rounded margin. Between the first two angles there was a distance of 21 lines, and between the last and a point midway the base of the fibrous circlet 18 lines. From this orifice the walls of sac spread out behind to the ventricular fissures, and anteriorly midway between the anterior fissure and left border upwards to the base of the left auricle and inferior vena cava, the apex projecting an inch and a half below that of the heart. From the situation of the communicating orifice its upper half must have been covered by the mitral valves, when they flapped back in the ventricular diastole.

From the preceding history it will be seen that this is an extremely interesting and unique case, and may be regarded as a true circumscribed aneurism of the ventricular wall, corresponding to similar diseases seated in the aorta, from fatty degeneration. Though it certainly possessed the re-

markable peculiarity of having a complete calcareous coating or layer, which I am not aware has been described to be ever possessed by the latter disease, yet I can readily imagine that this might be the condition of any artery undergoing degeneration of its tissues. The present disease, undoubtedly, began at an early period and always escaped notice, as happened in the case of the celebrated French tragedian Talma, who, it is stated, died of a partial aneurism of the parietes of the heart, which was revealed by dissection, though during life no signs had announced its presence. In this man there were no abnormal signs except an extension of cardiac dulness to the left side, which could hardly have indicated anything beyond hypertrophy or dilatation.

The two other diseases, bronchitis and arachnitis, with cerebral softening and suppuration, were undoubtedly dependent upon the heart-disease, and were the immediate causes of death.

ART. IX.—*Case of Premature Labour Artificially Induced.* By G. MOEHRING, M. D. and J. K. T. VAN PELT, M. D., of Philadelphia.

EQUAL in value to the discovery of a new therapeutical remedy is the safe and successful performance of an advised or theoretical manipulation in surgery or in surgical obstetrics. Hitherto, the absence of a reliable and harmless oxytoxic for inducing premature labour, unattended by danger to both mother and infant, was a want that has been greatly felt by obstetricians who have been consulted for that purpose; and it is, therefore, with a considerable degree of triumph and satisfaction, that Dr. Moehring and myself are enabled to add the following case to the recorded list of those labours which have been successfully accomplished by the process of that skilful accoucheur, Mr. Cohen, of Hamburgh. Cohen's method was an improved plan which followed the vaginal warm water douche of Kiwisch, being the same which Schweighauser, in 1825, proposed, viz., to inject water into the cavity of the uterus, the fluid being made to pass between the internal surface of that organ and the fœtal membranes. It is this operation which, from the ease with which it can be performed and controlled, we desire to advocate and recommend to the profession. That caution will necessarily always be required we need not enjoin. Fatal consequences may result from a too sudden dilatation of the cervix and os from the enormous fluid pressure contusing or rupturing the lower portion of the uterus, or else stretching the imperfectly developed uterine fibres beyond the power of reaction, causing paralysis or the separation of the placenta, or allowing the water itself or air sucked up with the fluid to be injected through the uterine veins and sinuses, and thus introduced into the circulation. There

is also the liability of forcing the water through the Fallopian tubes into the peritoneum. All these perils, noticed by Scanzoni, Guillier, Professor Simpson, and other eminent accoucheurs, are to be apprehended, and most carefully guarded against. Again, the amount of water to be injected is a very important consideration; when excessive, it has altered the presentation of the fœtus, as in the two cases noticed by Dr. Priestley, in one of these, causing the pelvic pole to take the place of the cephalic; the cause of this accident was the abnormal distension of the lower segment of the uterus, by so large a bulk of water, altering the ovoid form of that viscus and occasioning thereby such results.

Mrs. Z., the patient who was the subject of the operation, had resided for several years in New York. The physicians who conducted her delivery there in her first accouchement subsequently induced artificial labour in her fourth, fifth, and seventh pregnancies.

The history of each labour was very accurately stated by herself and husband, which was as follows: She was married at nineteen, and miscarried at the third month of her first gestation; again becoming pregnant, she fell into labour the ensuing fall, being then twenty years of age; this parturition was characterized by sufferings of a most intense and agonizing severity. It continued three days with some intervals of cessation. The presentation was cephalic, and the child was extracted by the long forceps. It was a male, and stillborn; the bi-parietal and bi-malar diameters of the cranium were pronounced by the medical attendants as unusually great. A miscarriage at the seventh week preceded the second child, which was prematurely delivered at the thirty-fifth week by the use of the sponge tent and the colpeurynter; it presented by the feet; the labour lasting from 2 P. M. until 8 P. M., no forceps assistance was required; the child was a female, and stillborn. The same method of premature labour was employed the following year to deliver a second female child at the thirty-second week, and again presenting by the feet; severe pains, lasting one hour only, accomplished the birth of a *living* infant, but some defect of its rectum or anus was assigned as the cause of its death, which occurred three days after. At the close of another year, the gestation of the fourth child being allowed to run out to term, labour began spontaneously, but becoming protracted, and her pains acutely distressing, while the head, from its impaction, was unable to advance, her medical attendant performed version by the feet. After the exit of the child's body the fœtal cranium became wedged in the pelvis, and to assist its descent, the blunt hook was inserted into the child's mouth, but the great tractive force employed breaking the jaw, it was then placed in the orbit, thus effecting the birth of the infant, a male, and stillborn; this labour lasted from 6 A. M. until 9 P. M. The fifth child, a female, and also stillborn, was prematurely delivered at the thirty-first week by the same method as the preceding; it presented by the breech, her labour lasting twelve hours;

the death of the infant was due from neglect to extract the head from the pelvis by timely instrumental interference, as stated by the parties.

From the foregoing narrative, it is seen that the three female children were pelvic presentations, and the males cephalic, and also that the conceptions followed so rapidly and immediately that her deliveries took place annually. The methods employed were also attended by great detriment to the health, as they occasioned severe attacks of dysuria, profuse menorrhagia, leucorrhœa, ulceration, and abrasion of the internal and external os; it was in this exhausted and weakened state of the constitution, attributable mainly to the modes thus used, that she again became enceinte, removing to Philadelphia for attendance here.

The first investigation of the dimension and shape of the pelvis was made by Dr. Moehring and myself, December 14th, being a careful, external, and vaginal measurement; and that the diagnosis should prove clear and positive, a repetition of the examination was made on three subsequent occasions. Our conclusions were, that the pelvis was eminently rachitic, that condition which Busch, of Berlin, a most able German writer on obstetrics, describes as resulting in early youth from an arrest of development in the lower limbs, as also in the transverse and ascending rami of the pubis, while the ossa ilia, upper body, the bust, and upper limbs, attain a natural growth; he states that this arrest ceases, however, but at a period too late to overtake or attain to an equality with the more favoured portion of the frame. This condition was well exemplified in our patient by the contraction of her superior strait; the length of whose conjugate or sacro-pubic diameter was judged to be but three inches, involving an elevation and advance of the promontorium, besides an abnormal approach towards the os pubis, and this view was further strengthened by the unnatural concavity of the sacrum visible externally while the diminutive lower limbs and well expanded chest clearly stamped the case as belonging to the order described by the authority mentioned. The inclination of her pelvis was unusually great. At our last interview, the partly expanded cervix could be easily touched, its tissues and the os were felt to be soft and capable of entrance. The peculiar dangers attending the modus operandi proposed, were now fully stated to the lady and her family, but the vivid recollections of her sufferings from the former manipulations induced them gladly to accept a proceeding that offered any chance of less distress, especially as it increased the probabilities of the delivery of a live infant. It was determined to induce labour at the thirty-second week, but upon further consideration this was deferred until the *thirty-third* week, from our extreme anxiety to favour the child's existence, not regarding the delay of a few days as in any way impairing the usefulness to the mother of the method advised.

The instruments employed for the operation were two No. 7 very smooth, flexible, gum-elastic male catheters, the vesical end of each termi-

nating for half an inch in a silver tube, with a perforation at the extremity, in addition to the lateral openings; to prevent the stilet protruding from any of the orifices, the wire was passed through a piece of cork one-fourth of an inch thick, as far as its ring, before inserting it into the catheter, thus avoiding any risk of its projecting point lacerating the membranes or uterus. The injecting apparatus used was the common hydrocele injecting bag, capable of holding five ounces, its nozzle made to fit accurately the catheter, and provided with a reliable stopcock.

It was agreed to induce labour on Monday, the 9th day of March, at 10 A. M., but a slight attack of indisposition occurring on the Sunday before, it was deemed prudent to postpone all interference until Tuesday, March 10th, on which day the operation was begun at 11 A. M. The bladder and bowels having first been fully evacuated, the injecting bag was carefully filled with water at a temperature of 70° Fh., until its surface came to a level with the edge of the extremity of the nozzle, hence insuring all absence of atmospheric air from this instrument. The patient was placed on her back, bringing down the hips to the edge of the bed, as in the usual obstetrical position for instrumental accouchement. The finger was now introduced within the os uteri to direct the catheter; and that instrument containing its stilet, so bent near its vesicular end as to assume a curve considerably less than that of the male sound, was well lubricated, and slowly and with great gentleness passed up into the cavity of the uterus, between its inner surface and the fœtal membranes. It passed in on the right side and advanced towards the front uterine wall, without our experiencing the slightest resistance; on withdrawing the stilet cautiously a few drops of blood escaped, proving that the catheter in its passage had separated the membranes from their adhesions with the womb. To measure how far the tube had penetrated within the organ, the second catheter was inserted within the vagina, until its extremity rested against the os, and then placing both in juxtaposition, the amount of separation of the two manual ends of each catheter indicated exactly the distance the first had entered, in this case shown to be five inches. Attaching the nozzle of the injection bag, five ounces of water was gradually injected; of this quantity a teaspoonful, only, escaped. The catheter was allowed to remain a few minutes and was then withdrawn; the only effect observable was the production of a drawing feeling about the abdomen, and a dragging sensation in the back. This speedily disappeared, and as soon as the patient became calm she was permitted to walk about her apartment, and we agreed to desist from further interference until nearly twelve hours had elapsed.

The interval of "twelve hours," Dr. Tyler Smith, who has followed this proceeding for several years, states as preceding the coming on of labour, and in his practice "labour was often not deferred as much as twelve hours from the time of using the injection, and generally it had commenced im-

mediately." Also the statistics of fifty cases that have been operated on in Germany by this means show, that in all, labour came on within twelve hours.

At 8 P. M. we found our patient moving about her room, having been entirely free from any pain or annoyance since the morning, the injected water had gradually drained off, and she pleasantly exclaimed, "Oh, this is too easy, you must cause me greater suffering; my nature cannot be so easily impressed, it is too strong to yield up a child so readily."

At our first injection we found it very difficult to reach the os, or retain the finger in it as a guide, as the extreme flexion of the thighs in the dorsal decubitus exerted so great a pressure against the overhanging abdomen as to lift the uterus out of the superior strait, thereby carrying the os almost beyond reach, and likewise causing painful cramps in her limbs. Abandoning this posture, she was now placed on her left side; the os was found unchanged, and the second injection was made in the same manner as the first, without the escape of the slightest quantity of water; the stilet was withdrawn, and in imitation of the practice followed in Germany, we allowed the catheter to remain, intending it to be retained until labour supervened, but in a few moments she complained greatly of a severe feeling of distension around the front of the abdomen and descending towards the back, assuming so violent a degree as to demand the speedy withdrawal of the instrument, when a total subsidence of the unpleasant symptoms followed, greatly relieving our anxiety. Shortly, however, she was seized with chilliness and shivering, cold feet, oppression at the chest, her eyes becoming somewhat sunk, pulse feeble and quick, all her symptoms simulating those of internal bleeding, but the application of artificial heat to the feet and body soon removed this collapsed condition. After remaining with her some hours we left for the night, having ordered Hoffmann's anodyne to be given in repeated doses, as also lime-water, for flatulence which was present. Meeting the following morning at 11 A. M., we found our patient had enjoyed perfect repose during the night, and had passed, just before our visit, some of the water with a clot of blood in it. On examination, we found the os further down, dilated about two inches, and its temperature, as well as that of the vagina, cooled, by the draining of the injected water, to a most remarkable degree below the natural heat of those organs; the finger could also be passed into the uterus around the membranes, and the child's head was plainly felt resting on the symphysis pubis. It was thought best to let her rest to-day undisturbed; an ounce of castor oil was ordered, and she was permitted to recruit her strength by using beef essence freely. This day was spent quietly, with perfect freedom from labour-pain, and at night she had a long and refreshing slumber.

On Thursday morning at 11 A. M., the condition of the patient being every way favourable, and no symptom of labour beyond the slight dilatation of the os being manifest, she was again placed on her left side and the

catheter carried within as before; five ounces of water were injected, which at first refused to flow from the bag, as if an impediment to its advance existed by the adhesions between the membranes and uterus, when suddenly, the obstacle being overcome, the water rapidly left the elastic bag, flowing between the membranes and womb, the greater portion returning into the vagina. Four ounces more were immediately injected, some of which soon escaped through the os. The motions of the child had been felt very strongly since the injection used the day before, and were now very active; the waters also were more tense, rendering a greater caution necessary in introducing the catheter, for fear of rupturing them prematurely. In two hours labour had become very strong, and as the membranes relaxed, the head was diagnosed to be in the first position of the vertex, but still resting on the transverse ramus of the pubis. By 2 P. M. the os was nearly dilated, the pains occurring every five minutes, and the head had descended into the brim, giving every indication of delivery in a short time. At 3 P. M. the os was entirely dilated, and she referred her pains chiefly to the lower part of the abdomen. As the advance of the head now seemed delayed, it was determined to evacuate the waters at 5 P. M. if no progress was perceptible; this was done. At 6 P. M. there was no further descent of the child, and placing her on the back, it was found to cause both the head and os to recede; a shortness of the cord was suspected as the cause of our delay. As the dorsal position seemed to lessen the strength of the pains, which also became fewer and further apart, it was found, on a trial, that a right or left lateral decubitus favoured both their strength and rapidity. She was therefore allowed to assume these alternately. By 8 P. M. the head evidently had moved from its stationary position towards the excavation encircled by the swollen os, though so loosely that the periphery of the opened cervix was not made tense or distended by the pains. At half-past 9 P. M., the head, sinking within the excavation, stretched the dilated os to its fullest capacity, when it was pressed up past the fœtal cranium by the finger. At 10 P. M. the birth of the infant was fully accomplished; it was a male, and opened its eyes, gasping and moaning immediately upon its exit from the maternal organs. The cord was unusually short, and was wound around its neck and left arm; from prudential motives we did not sever the connection between the placenta and fœtus until all pulsation ceased in the umbilical vessels. The placenta came away without difficulty or any hemorrhage. The measurement of the diameters of the head was made, giving for the occipito-mental, 5 inches; occipito-frontal, $4\frac{8}{16}$ inches; bi-parietal, $3\frac{11}{16}$ inches; cervico-bregmatic, $3\frac{11}{16}$ inches; its circumference was 13 inches.

The next day the nurse reported the condition of the child as every way satisfactory; it swallowed easily and eagerly its nourishment, and had several evacuations of meconium and urine; it was ordered to be kept permanently on its right side, and from its birth to the present date has been unusually exempt from the customary infantile indispositions.

The recovery of our patient was rapid; the lacteal functions were well established, and not one unpleasant symptom has appeared since her delivery; in three weeks she received her friends in her parlour, and is enjoying perfect immunity from all the female maladies which, for past years, have in combination been the harassing sequences of her puerperal state.

The New York physicians, in their statements to Mrs. Z., pronounced the conjugate diameter of the superior strait to be *less* than three inches. The careful measurements made anteriorly and subsequently to this labour, have confirmed our diagnosis of its length being *fully* three inches.

In support of the propriety of our treatment of this case, I shall quote here the instructions which Scanzoni has given in regard to the subject, as found at page 730 of his Lehrbuch Der Geburtshilfe. He there declares that, "on the authority of Marinus, Ritgen, Stoltz and Kiwisch, artificial labour must be employed when the dimension of the conjugate diameter of the superior strait is abnormally small," and minutely points out the time by the following schedule, viz. :—

When the sacro-pubic diameter is	2	inches and	6 or 7	lines, induce labour at the	30th	week.
"	"	2	"	8 or 9	"	"	31st	"
"	"	2	"	10 or 11	"	"	32d	"
"	"	3	"			"	33d	"
"	"	3	"	1 line,		"	33d	"
"	"	3	"	2 or 3	"	"	34th	"
"	"	3	"	4 or 5	"	"	35th	"
"	"	3	"	2 or 6	"	"	36th	"

Scanzoni observes that the necessity of producing premature delivery may be argued from the fatality resulting to the children previously born, whether caused by the compression of their heads when excessive in volume, or by a contraction of the pelvis; this is conditional, however, as a subsequent child might be smaller, and with ease and safety pass through a diameter of three, or three and three-quarters of an inch. Further delay in the case of Mrs. Z. would have been imprudent, as a sudden and very rapid increase in bulk of the uterine contents very ostensibly took place at the thirty-third week. As it was, the tardy character of her labour towards its close gave us sufficient reason to believe that instrumental interference would be advisable if delivery was protracted beyond 12 P. M.; the development acquired by the child, from too long a postponement of the artificial induction of labour, would, without doubt, have required a forceps delivery.

A more expanded and detailed account of this case has been given than was first intended, and our limits prevent any comparison between Cohen's process and the various methods employed. The life of a child, the security and health of its parent, the credit of preserving and continuing male issue to the family, under a knowledge of the discouraging antecedents, are achievements which must strongly recommend the means employed by us with such signal success.

TRANSACTIONS OF SOCIETIES.

ART. X.—*Summary of the Transactions of the College of Physicians of Philadelphia.*

1863. *Feb.* 4. *Report on Meteorology and Epidemics for* 1862.—DR. WILSON JEWELL read the following report:—

In offering my Annual Report on the Meteorology and Epidemics of our city for 1862, or in other words, on its hygienic condition and relative mortality, I would acknowledge our indebtedness to a beneficent Providence, for the good degree of health with which we have been favoured throughout the year.

METEOROLOGICAL RECORD.—The accompanying abstract of meteorological observations is furnished as usual by Prof. J. A. Kirkpatrick, A. M. His observations are made for the Smithsonian Institution. He has also added a comparative table of atmospheric phenomena for the last eleven years, for Philadelphia.

The mean temperature of the year 1862 was 53.58°, and stands one and one-eighth of a degree below that of 1861, and seven-tenths above that for eleven years.

The maximum temperature (95½°) occurred on the 7th day of July. The minimum temperature (8°) was on the 21st of December. The range of the temperature for the year was 87½°.

The warmest day of the year was August 9th, when the mean of the thermometer stood 87.67°. The coldest day was December 20th, when the mean for the day was 15.83°.

The maximum pressure of the atmosphere (30.555 inches) occurred on Nov. 16th; the minimum (29.216 inches) was on February 24th. The mean of the barometer for the year was 29.846 inches, which was a fraction lower than for 1861, and for the average of eleven years.

The force of vapour was less than for 1861, and for the average of eleven years.

The relative humidity of the atmosphere was greater than for 1861, but less than the average for eleven years.

The amount of rain that fell was nearly an inch more than in 1861, 45.656 inches, but three-quarters of an inch less than the average for eleven years.

It rained or snowed 134 days during the year. The month of June furnished the greatest amount of rain, 6.592 inches, when it rained 15 days. August the least, 1.455 inches, and for only 7 days.

General Abstract of Meteorological Observations, made at Philadelphia, Pa., during the year 1862.

By JAMES A. KIRKPATRICK, A. M., Prof. of Civil Engineering in the Central High School of Philadelphia.

(Barometer sixty feet above mean tide in the Delaware River.)

1862.	THERMOMETER.									BAROMETER REDUCED TO 32° F. But not corrected for altitude.							
			RANGE.		Mean of daily oscillations.	MEANS.						RANGE.		MEANS.			
MONTHS.	MAX.	MIN.	Monthly.	Mean daily.		7 A. M.	2 P. M.	9 P. M.	Average.	MAX.	MIN.	Monthly.	Mean daily.	7 A. M.	2 P. M.	9 P. M.	Average.
	°	°	°	°	°	°	°	°	°	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
January . . .	54	10	44	5.04	10.21	29.36	34.47	31.97	31.93	30.408	29.325	1.083	.261	29.942	29.894	29.931	29.922
February . . .	52	16	36	5.55	10.89	28.36	36.00	31.64	32.00	30.322	29.216	1.106	.225	29.939	29.891	29.922	29.917
March	56	22	34	3.95	14.44	34.24	44.21	39.18	39.21	30.173	29.276	.897	.173	29.804	29.747	29.795	29.782
April	82	28	54	5.89	17.87	44.67	55.23	48.26	49.36	30.321	29.422	.899	.146	30.025	29.979	29.994	29.999
May	85	40	45	5.77	19.81	57.85	70.08	61.32	63.08	30.058	29.518	.540	.124	29.785	29.740	29.760	29.762
June	89	47	42	5.34	17.60	64.57	74.72	66.75	68.68	30.146	29.375	.771	.123	29.738	29.706	29.728	29.724
July	95½	53	42½	4.23	17.50	71.13	82.06	73.60	75.60	30.156	29.487	.669	.107	29.743	29.724	29.731	29.733
August	95	54	41	3.89	16.56	71.47	82.93	75.13	76.51	30.099	29.557	.542	.122	29.829	29.796	29.818	29.814
September . . .	87	48	39	4.30	16.22	63.53	76.03	67.55	69.04	30.086	29.398	.688	.128	29.861	29.845	29.876	29.867
October	86	35	51	5.48	15.31	53.70	64.29	56.98	57.99	30.201	29.307	.894	.151	29.865	29.825	29.869	29.850
November . . .	71	27	44	5.94	13.40	40.67	48.18	43.25	44.03	30.555	29.380	1.175	.159	29.877	29.823	29.870	29.857
December . . .	64	8	56	6.46	12.74	32.24	39.76	34.71	35.57	30.495	29.319	1.176	.197	29.932	29.895	29.936	29.921
Annual means .	95½	8	87½	5.15	15.21	49.22	59.00	52.53	53.58	30.555	29.216	1.339	.160	29.863	29.822	29.852	29.846
Winter	64	10	54	5.42	11.89	30.08	37.58	33.16	33.60	30.462	29.216	1.246	.215	29.973	29.926	29.955	29.951
Spring	85	22	63	5.20	17.37	45.55	56.51	49.59	50 55	30.321	29.276	1.045	.148	29.871	29.822	29.850	29.846
Summer	95½	47	48½	4.49	17.22	69.06	79.90	71.83	73.60	30.156	29.375	.781	.117	29.770	29.742	29.759	29.757
Autumn	87	27	60	5.24	14.98	52.30	62.83	55.93	57.02	30.555	29.307	1.248	.146	29.874	29.831	29.868	29.858
For eleven years	100½	—5½	106	5.57	15.19	49.69	59.96	53.14	54.26	30.704	28.884	1.820	.156	29.890	29.850	29.874	29.871

Meteorological Observations—Continued.

1862.	Relative Humidity.					Force of Vapour.						Rain and Melted Snow.		Clouds. Percentage of sky covered.				Winds.	Dew-point.					
			Means.					Means.						Means.							Means.			
Months.	Max.	Min.	7 A. M.	2 P. M.	9 P. M.	Max.	Min.	7 A. M.	2 P. M.	9 P. M.	Average.	Amount.	No. of days on which it fell.	7 A. M.	2 P. M.	9 P. M.	Average.	Monthly resultant; No. of times in 1000.	Max.	Min.	7 A. M.	2 P. M.	9 P. M.	Average.
	p. c.	p. c.	p. c.	p. c.	p. c.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	days.	p. c.	p. c.	p. c.	p. c.	Direction from.	°	°	°	°	°	°
January . .	100	32	80.0	70.7	75.4	.275	.051	.134	.145	.142	.140	4.500	16	75	74	74	74	N. 18° 26′ W., 335	42.7	3.4	23.31	25.23	24.49	24.51
February . .	100	44	80.4	66.6	77.9	.267	.060	.130	.143	.142	.138	4.277	15	76	73	61	70	N. 45° 0′ W., 208	42.0	7.3	23.08	25.57	25.43	24.69
March . . .	95	25	74.4	56.2	70.5	.389	.081	.149	.159	.171	.159	3.500	11	62	66	66	65	N. 43° 7′ W., 377	52.1	13.9	26.76	28.05	29.86	28.22
April. . . .	94	18	67.8	48.5	64.5	.555	.091	.211	.219	.228	.219	3.947	11	69	67	49	62	N. 45° 0′ E., 47	61.9	16.2	34.15	34.34	35.95	34.81
May	93	18	64.2	44.9	60.3	.594	.105	.320	.324	.335	.326	2.083	9	60	60	41	54	N. 53° 37′ W., 136	63.9	19.4	44.89	45.03	46.53	45.48
June	94	33	74.7	55.5	74.3	.770	.180	.463	.470	.498	.477	6.592	15	72	67	51	63	S. 79° 23′ W., 97	71.4	31.8	55.94	56.43	57.91	56.76
July	97	36	72.7	49.7	71.0	.813	.311	.561	.544	.594	.566	2.841	10	64	63	50	59	S. 58° 24′ W., 186	73.1	52.1	61.70	60.80	63.41	61.97
August . . .	87	30	70.5	45.6	65.4	.939	.290	.562	.524	.586	.557	1.455	7	47	59	38	48	S. 90° 0′ W., 117	77.4	44.1	61.15	59.16	62.38	60.89
September . .	97	32	77.1	54.0	75.4	.833	.211	.465	.490	.519	.491	6.282	6	59	50	45	51	N. 4° 5′ E., 87	73.8	35.9	55.82	57.31	59.30	57.48
October . . .	97	33	79.5	59.7	73.5	.695	.133	.340	.378	.365	.361	4.160	11	54	52	49	52	N. 73° 30′ W., 163	68.4	24.6	46.81	48.85	48.21	47.79
November . .	100	37	79.4	64.5	75.1	.548	.106	.213	.228	.224	.222	4.455	15	64	64	64	64	N. 79° 0′ W., 237	61.6	19.6	34.64	35.95	35.70	35.43
December . .	92	31	78.5	61.5	74.8	.377	.040	.164	.163	.162	.160	1.555	8	53	59	43	51	N. 84° 24′ W., 301	51.2	—1.4	26.45	27.27	27.55	27.09
Annual means	100	18	74.9	56.4	71.5	.939	.040	.308	.316	.330	.318	45.656	134	63	63	52	59	N. 58° 40′ W., 159	77.4	—1.4	41.22	42.00	43.06	42.09
Winter . . .	100	23	80.0	66.4	77.3	.390	.051	.140	.154	.152	.149	10.793	35	70	67	56	65	N. 47° 35′ W., 274	52.1	3.4	24.60	26.76	26.57	25.98
Spring . . .	95	18	68.8	49.9	65.1	.594	.081	.227	.234	.245	.235	9.539	31	64	65	52	60	N. 48° 18′ W., 143	63.9	13.9	35.27	35.81	37.44	36.17
Summer . . .	97	30	72.6	50.3	70.2	.939	.180	.529	.513	.559	.533	10.888	32	61	63	46	57	S. 72° 58′ W., 128	77.4	31.8	59.60	58.80	61.23	59.87
Autumn . .	100	32	78.7	59.4	74.7	.833	.106	.339	.365	.369	.358	14.897	32	59	55	53	56	N. 64° 56′ W., 140	73.8	19.6	45.59	47.37	47.74	46.90
For eleven yr's	100	13	76.1	57.5	72.4	1.059	.013	.324	.341	.345	.337	44.936	127	59	60	45	55	N. 74° 29′ W., 227	79.7	—16.5		43.52		

A Comparison of some of the Meteorological Phenomena of the year 1862 *with those of* 1861, *and of the last* ELEVEN *years, at Philadelphia, Pa.*

Lat. 39° 57½′ N. Long. 75° 10½′ W. from Greenwich. Height of barometer fount, sixty feet above mean tide in the Delaware River.

	1862.	1861.	11 YEARS.
THERMOMETER.			
Highest—Degrees .	95½° July 7	95° July 8	100½° July 21, 1854
Lowest " .	8 Dec. 21	—1 Feb. 8	—5½ Jan. 23, 1857
Mean of warmest day	87.67 Aug. 9	87.80 July 8	91.30 July 21, 1854
Coldest day—mean	15.83 Dec. 20	7.80 Jan. 13	—1.00 Jan. 9, 1856
Mean daily oscillat'n	15.21	16.85	15.19
" range .	5.15	5.57	5.57
Means at 7 A. M. .	49.22	50.15	49.69
" 2 P. M. .	59.00	60.74	59.96
" 9 P. M. .	52.53	53.24	53.14
" for the year	53.58	54.71	54.26
BAROMETER.			
Highest—Inches	30.555 in. Nov. 16	30.526 in. Jan. 23	30.704 in. Jan. 28, 1853
Lowest " .	29.216 Feb. 24	29.096 May 27	28.884 Apr. 21, 1852
Great'st d'y pressure	30.509 Nov. 16	30.483 Jan. 23	30.611 Dec. 18, 1856
Least daily pressure	29.390 Feb. 24	29.243 May 27	28.959 Apr. 21, 1852
Mean daily range .	0.160	0.167	0.156
Means at 7 A. M. .	29.863	29.890	29.890
" 2 P. M. .	29.822	29.845	29.850
" 9 P. M. .	29.852	29.870	29.874
" for the year	29.846	29.868	29.871
FORCE OF VAPOUR.			
Greatest—Inches .	0.939 in. Aug. 8	0.841 in. Aug. 5	1.059 in. June 30, 1855
Least " .	0.040 Dec. 20	.023 Feb. 8	.013 Feb. 6, 1855
Means at 7 A. M. .	.303	.319	.324
" 2 P. M. .	.316	.332	.341
" 9 P. M. .	.330	.343	.345
" for the year	.318	.331	.337
RELATIVE HUMIDITY.			
Greatest per cent. .	100 per ct., often	100 per ct., often	100 per ct., often
Least " .	18. Apr. 27, May 8	18 " May 2	13 " Apr. 13, 1852
Means at 7 A. M. .	74.9 per ct.	74.8 "	76.1 "
" 2 P. M. .	56.4	54.9	57.5
" 9 P. M. .	71.5	72.5	72.4
" for the year	67.6	67.4	68.7
CLOUDS.			
No. of clear days .	100 days	109 days	111.7 days
" cloudy days	265 "	256 "	253.5 "
Means of sky covered at 7 A. M. .	62.9 per ct.	58.7 per ct.	59.5 per ct.
" 2 P. M. .	62.8	61.6	60.0
" 9 P. M.	52.5	46.2	44.8
for the year .	59.4	55.5	54.8
Rain or melted snow, amount .	45.656 in.	46.414 in.	44.936 in.
No. of days on which rain or snow fell	134 days	125 days	127 days
Prevailing winds, from	N. 58° 40′ W. .159	N. 81° 41′ W. .239	N. 74° 29′ W. .227

BIRTHS, MARRIAGES AND DEATHS.—It will be highly gratifying to the fellows of the College to learn, that the law for the registration of births, marriages, and deaths, in which they took an early and active part, has thus far been attended with very satisfactory results. Nor will it be considered a useless repetition to add, that it has already become a popular and permanent institution of our city. No expense has been spared by the Board of Health, to carry out efficiently the objects of this law. Nor is it any longer considered an unnecessary tax upon time, by those who are required to make their returns. For the most part the law is cheerfully and promptly complied with by all. The few exceptions to this are rapidly yielding their opposition, as the value of the law becomes more generally known and appreciated.

Births.—The births registered for the year 1862 (Table I.) have amounted to 14,741; of these, 7609 were males and 7132 were females. This shows an excess in favour of males equal to 7 per cent.

From investigations made by M. Villermé, of Paris, and confirmed by Dr. Emerson, in a paper on the Medical Statistics of Philadelphia, published in 1831,[1] in which he constructed a table of the births for each month, during a period of ten years, he showed that certain months of the year, independent of other causes, exerted an unfavourable influence on both conception and the increase of population by reproduction. "These causes seem to prevail during the extreme heat of summer and in the commencement of autumn, the months of August, July and September, standing lowest in the scale designating the months of conception."

By taking the number of births for each month during the two full years in which the registration law has been in operation, 1861 and 1862, and arranging them so as to place those highest in the scale of births in their numerical order, and opposite to these the corresponding months of conception, and similar results with those procured by Dr. Emerson, on a larger scale, will be observed, as in the following table:—

Months.	Whole Number of Births.	Corresponding Months of Conception.
1. January	2898	June
2. March	2893	April
3. December	2706	October
4. February	2702	November
5. August	2695	March
6. October	2684	May
7. November	2684	February
8. July	2676	December
9. September	2667	January
10. June	2497	September
11. May	2459	July
12. April	2451	August

Thus it will be seen, that the months furnishing the minimum of births and conceptions for the two years correspond with those given by Dr. Emerson for a period of ten years, viz: August, July and September, the months of conception, and April, May and June the months giving the lowest number of births.

[1] Am. Journal of the Medical Sciences, vol. ix. p. 21.

TABLE I.—*Table of Births under the Registration Law, for the year ending December 31, 1862, with the Wards, Sexes, and Colour designated, together with the Percentage and Ratio of Births to Population of each Ward.*

MONTHS.	Total.	BIRTHS.		BLACK.		STILLBORN.		Twins.	Triplets.	WARDS.									
		M.	F.	M.	F.	M.	F.			1	2	3	4	5	6	7	8	9	10
January	1,396	751	645	14	14	46	30	12	..	87	57	57	53	42	27	76	42	35	51
February	1,228	645	583	5	6	36	19	8	..	79	54	34	71	24	41	71	23	39	41
March	1,325	645	680	8	9	38	22	16	..	80	60	45	70	30	36	61	27	28	41
April	1,128	572	556	11	13	27	25	8	..	78	54	47	53	32	29	58	28	20	42
May	1,173	615	558	13	10	33	33	17	..	77	62	44	58	27	25	50	36	24	51
June	1,162	584	568	8	12	23	29	19	..	76	63	47	53	22	33	70	37	20	20
July	1,181	610	571	7	14	33	25	11	..	83	68	32	53	44	30	54	29	27	34
August	1,206	627	579	21	14	35	26	14	..	81	57	47	61	37	30	57	33	28	49
September	1,227	622	605	7	9	31	18	8	..	108	64	45	56	34	25	54	33	32	30
October	1,266	683	583	2	17	48	23	17	..	90	73	36	58	36	25	66	28	34	44
November	1,231	650	581	15	5	37	23	8	..	86	63	48	60	23	25	53	32	32	47
December	1,228	605	623	6	11	27	24	16	1	91	74	33	47	32	35	50	25	33	31
Total	14,741	7609	7132	117	134	414	297	154	1	1016	749	515	693	383	361	720	372	352	490
Population of each ward										30,886	29,123	19,929	23,461	24,792	14,882	31,267	27,770	17,196	21,549
Percentage of births to population										3.28	2.57	2.58	2.95	1.55	2.42	2.30	1.34	2.04	2.24
Ratio of births to population										30.39	38.88	38.69	33.85	64.72	41.22	43.42	74.65	48.85	44.58

MONTHS.	WARDS.															Wards not given.
	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
January	54	40	55	47	107	43	81	43	100	84	49	45	30	63	20	8
February	39	49	37	38	82	49	61	34	92	74	40	37	47	64	6	2
March	31	48	40	49	95	61	72	48	100	74	43	37	47	76	18	8
April	33	44	31	38	63	56	53	40	79	61	42	32	41	54	17	3
May	33	28	30	47	86	44	51	40	79	80	34	41	38	61	13	5
June	32	28	46	52	72	46	64	41	55	71	31	44	31	69	17	3
July	32	36	31	46	80	39	46	42	69	85	37	44	33	96	13	3
August	31	28	24	46	81	49	64	46	74	86	42	32	40	64	16	3
September	43	43	39	52	97	57	61	33	73	60	36	34	44	52	12	1
October	47	39	48	65	78	52	55	45	67	80	43	35	36	58	24	4
November	47	32	37	40	85	47	65	37	100	77	31	35	33	67	22	4
December	40	50	45	52	80	62	67	33	69	82	29	47	43	49	16	13
Total	464	465	463	572	1009	605	770	480	957	923	457	463	463	743	194	62
Population of each ward	16,681	16,681	20,045	24,258	32,091	20,067	23,264	20,441	38,828	29,963	17,150	17,173	23,985	23,738		
Percentage of births to population	2.78	2.78	2.31	2.35	3.14	3.01	3.30	2.34	2.46	3.08	2.66	2.69	1.93	3.13		
Ratio of births to population	35.95	35.87	43.29	42.40	31.80	33.16	30.21	42.58	40.57	32 46	37.54	37.09	51.80	31.94		

The explanation proposed by M. Villermé to account for the variation found at different seasons in the births and conceptions, was "the direct or indirect influence of the annual revolution of the earth around the sun, or in other words, to the order of the seasons." Dr. Emerson falls in with the views of the French *savan*, that fecundity in this region at least, is materially affected by high temperature, but considers that an epidemic influence, during the period embraced in his calculations, acted as a retarding force to conception.

I am therefore disposed to attribute the diminished number of births in the months of April, May and June, for the two years past, to the extreme heat in the corresponding months of conception, viz: August, July and September, in connection with the insalubrity of the season, as it is well understood that the prevalence of endemics, during these months, increases materially our bills of mortality.

The first ward, with a population of 30,886, contributed 1006, equal to an increase of 3.28 per cent. of its population. The fifteenth, containing 32,091 souls, gave 1009, or an increase of 3.14 per cent. The nineteenth ward, with its teeming population of 38,828 does not appear to be as productive as the two former wards, as it added only 957 births, an increase of 2.46 per cent. This number of recorded births is less by 2530, or 2.72 per cent., than that of 1861.

This falling off cannot be attributed to a defective record, caused by a delinquency on the part of those appointed to collect the births, or of those required to make returns. The greatest watchfulness has been observed by the health officer and his clerks, to secure the monthly returns, and I have the assurance that the number of physicians and midwives making returns, has been greater than those for 1861.

I can only attribute this decrease in the number of births, to the disturbing events connected with the rebellion.

It will be borne in mind that not only epidemics, but other agencies of a moral, social and national character, operating on a community to the depression of their mental and physical energies, will, by reducing the forces of organic life, unfavourably affect the increase of the population by reproduction.

I therefore believe that to the discouraging influences of the present war, and the agitated and unsettled state of the country, may be justly ascribed, in a great measure, the falling off of the totals of births for the year.

The daily average of births has been 40¼.

The first three months of the year furnished the largest number of births, April, May and June the lowest. January gave the highest, 1396, and April the lowest, 1128.

The most prolific ward appears to have been the seventeenth which yielded 770 births, or 3.30 per cent. in a population of 23,264.

The ward yielding the fewest births according to its population was the eighth. With a population of 27,770 it gave only 372 births, or 1.34 per cent., which is only one in 74.65 hundredths of its inhabitants.

In fifteen out of the twenty-five wards, the births exceeded the deaths. The fifteenth, twentieth, twenty-first, and twenty-second wards, presented the greatest contrast between the births and deaths. In the former, they exceeded the deaths by 190. In the three latter, they averaged an excess of 174.

In the remaining ten wards, the deaths exceeded the births, and the inference is a want of material prosperity in the community, or a defect in their natural numerical growth.

The preceding year (1861) yielded an increase of population by births over the deaths of 19 per cent. The year under consideration (1862), shows a decrease in population, by the deaths exceeding the births, equal to 2.38 per cent. This calculation is based upon the aggregate of deaths recorded for the year, but if the deaths of soldiers are deducted, the births will furnish an increase in the population of 6 per cent. over the waste by death.

The number of births on record from our coloured population amounted to 251. The deaths in the population reached 721. This record gives an excess of deaths among blacks of 65 per cent. over the births, and if the hypothesis be true, that a preponderance of births over deaths in a community is an index of prosperity in numerical growth, the inference is that our black population is diminishing.

Twin births to the number of 154 have been recorded. One triplet birth was returned for the year, in the month of December.

The stillbirths amounted to 711. Of this number 414 were males and 297 were females; an excess of male stillborn children equal to 39 per cent.

Marriages.—The total of marriages recorded for the year (Table II.) have been 4662, an increase of 245 over those for 1861.

TABLE II.—*Ages of Persons Married and recorded under the Registration Law for the year ending December* 31, 1862.

		AGES OF THE WOMEN.								TOTAL OF THE MEN.
		Under 20	20 to 25	25 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	Age not given.	
AGES OF THE MEN.	Under 20	15	4								19
	20 to 25	565	798	92	13	3				12	1483
	25 to 30	166	760	328	64	4				17	1339
	30 to 40	62	326	276	198	20	1			6	889
	40 to 50	2	38	58	124	42	1			6	271
	50 to 60		4	6	35	24	16	1		1	87
	60 to 70		1	1	3	10	10	1		1	27
	70 to 80				1	3	3	2			9
	Age not given.	6	8	7	2					515	538
TOTAL OF THE WOMEN.		816	1939	768	440	106	31	4		558	4662

This department of the office does not afford the same amount of satisfaction that is given in the other branches. The defect is due alone to the indifference on the part of clergymen in making their returns in accordance with the law.

The table referred to gives the ages of the parties married as far as they were returned. It will be seen, however, that in 1096, or about 12 per cent. of the names returned, the ages were not given.

Of the parties married, 816, or 17.50 per cent. of the brides, were under twenty years of age, whereas only 19 of the grooms, or 00.47 per cent. were in their minority.

The most popular age for marriage appears to be between twenty and twenty-five. During this quinquennial period there were 1939 brides, equal to 41.59 per cent. of the total of marriages, and 1483 grooms, equal to 31.81 per cent.

Previous to this period, or twenty-five years of age, the brides, in point of numbers, are in the ascendant, but beyond it they rapidly decline, while the grooms increase.

Between twenty-five and thirty, there were only 768 brides or 16½ per cent., and 1339 or 28.72 per cent. of grooms.

There are nine marriages registered of men between seventy and eighty, and four women between the ages of sixty and seventy.

Table III. furnishes a record of the nativity of the brides and grooms.

TABLE III.—*Number of Marriages registered under the Registration Law for the year ending December* 31, 1862, *with the Nativity of the Brides and Grooms.*

NATIVITIES.		BIRTHPLACE OF BRIDES.			TOTAL OF GROOMS.
		United States.	Foreign.	Not given.	
BIRTHPLACE OF GROOMS.	United States . . .	2234	239	26	2499
	Foreign	425	1535	4	1964
	Not given	27	14	153	199
TOTAL OF BRIDES		2686	1788	188	4662

Of the whole number of persons married, 5185, equal to 55 per cent., were American born, and 3752, or 40 per cent., were of foreign birth.

387 or 4 per cent. of the parties married, were returned without their place of birth being named.

2686, or 57.61 per cent., of the brides were American born; of these, 425, or 16 per cent., married foreigners, while only 9 per cent. of the grooms born in the United States married foreign women.

Deaths.—The following table furnishes a general summary of the deaths for the year 1862:—

White		14,376
Coloured		721
Total		15,097
Males		8,315
Females		6,782
Total		15,097
Male minors or children	4,266	
Female " "	3,772	
Total minors		8,038
Male adults	4,049	
Female adults	3,010	
Total adults		7,059
Total		15,097
Deaths from registered diseases		13,232
Deaths from stillborn		711
Deaths from old age		219
Deaths from unknown causes		97
Deaths from external and accidental causes		838
Total from all causes		15,097

A comparison of this total of 15,097 with the total returns of the previous year, 1861, will show an increase of deaths recorded for 1862, amounting to 629, equivalent to an increase of 4 per cent., and is the highest aggregate on record of any former year.

The announcement of this fact is at variance with my congratulatory introduction, and requires an explanation.

It would be doing great injustice to the sanitary and mortuary interests of our city if the conclusion should be entertained that the augmentation of deaths for the year 1862, as found upon the record, has been the result of a high rate of city mortality growing out of, and influenced by the invasion and progress of epidemic diseases. Fortunately, there is ample and incontestable evidence to prove the contrary.

A single glance at the death-table from zymotics—an index of public health—a class of diseases by which may be distinguished the salubrity or unhealthiness of the year, furnishes the proof that they have fallen off in the aggregate to the extent of 558, equal to 16 per cent. when compared with those of the previous year, 1861.

One remarkable sign of the improved condition of the health of our city is the fact that those destructive epidemic diseases, scarlet fever, smallpox, and diphtheria, which prevailed in 1861 to a fearful degree, carrying to the grave 2450 of our population, have this year carried off only 1397 or 57 per cent. less than in 1861, and ere the year 1862 had closed, their epidemic influence was so far diminished as scarcely to have been recognized in the community.

There is, however, an agency foreign to the ordinary operating causes for the increase of our city mortality that has contributed in a large degree to swell the number of the annual death-roll. It is the war in which the country is at present involved. From this cause alone it can be shown that 1202 of the deaths registered are of the number who had fallen on the

battle-field, or had died from disease contracted in the camp, or on the march, many of whom have expired in the government hospitals throughout our city, and many who had returned home only to die among their friends.

None of these deaths properly belong to the annual mortality of the city, and in order to form a correct estimate, every one of them should be deducted. By this method the mortality will be reduced to 13,895 or about 4 per cent. less than that of 1861.

It may therefore with safety be announced that, notwithstanding the successful operation of the registration law, to which I so fully referred in my last report, and which enables us to secure a nearer approximation to the true number of deaths than ever before, the deaths of 1862 fall below those for 1861. This result furnishes the evidence that the city has been comparatively healthy during the year.

Nor is this good share of health to be ascribed in any measure to extensive sanitary improvements through the agency of our municipal authorities. As in former years, so with the past, very little interest has been taken towards the improvement of the hygiene of our city on the part of our councils.

The river docks continue to be receptacles for every description of filth, sending forth their fetid and deleterious miasma into the atmosphere; the city sewerage, with all the attention recently bestowed upon the traps at the inlets to the culverts, still afford imperfect drainage. Under existing arrangements, which allow the indiscriminate use of the culverts for conveying away the deposits of privies and water-closets, as well as the solid refuse from houses, yards, gutters, and streets, they may eventually entail upon the community a far greater sanitary evil than they are designed to remove.

The system of street-cleaning is still defective in many essentials. At best, it is very imperfectly executed. Many districts of the city, where the greatest need exists for sanitary conservation, receive but little if any attention.

Intra-mural interments, as applicable to those graveyards located in densely-populated neighbourhoods and in grounds already crowded to saturation with the decomposing remains of the dead, continue to be a nuisance, dangerous to public health, demanding legislative enactment as the only certain remedy for their entire abatement.

The proper disposal of street dirt and kitchen garbage, with their disgusting and unhealthy emanations, especially during the warm months—underground and cellar tenements, and other domiciliary arrangements, where defective light and ventilation with an overcrowded population and a want of the common conveniences of life prevail—slaughter-houses, hogs and pens, cow stables, filthy yards and alleys, together with a host of offensive manufacturing establishments, and a great diversity of minor nuisances, continue to be sanitary evils, crying aloud for redress.

These and similar causes may be regarded as among the prominent baneful influences contributing to depress the vital energies of our population, and engendering diseases of zymotic origin—diseases that are preventable, and which, with a more general knowledge of the laws of hygiene and a wisely directed practice, would in a great measure be obviated.

In addition to these prevalent and established causes for atmospheric contamination during the year, our once quiet and peaceful city was selected by the government as a location admirably adapted for hospital accommodations for the sick and wounded of the army. During the year

just closed there have been as many as twenty-two (22) military hospitals opened and occupied in various sections of the city.

Great anxiety at one time was felt for the health of the city when these hospitals were about to be opened. It was hardly to be expected that the introduction of several thousand cases of wounded and sick soldiers, under the most unfavourable circumstances for hygienic purposes, could take place—in addition to our ordinary amount of disease—without their exerting a contaminating atmospheric influence upon the sick as well as upon the healthy of the community. Nor was the fact that camp and typhoid fevers and dysenteries, and suppurating wounds of every description, would make up a large majority of the cases, and that the remainder would comprise the broken-down and feeble of the army, whose depraved systems were already thoroughly prepared for infection, calculated to lessen the excitement in the public mind.

It is highly gratifying, however, to be able to report that these fears and apprehensions have proved groundless. The admirably selected locations of these hospitals, with but few exceptions; the excellent management and unremitted attention of the surgeons in charge; the skill displayed by the attending surgeons and physicians; the valuable hygienic arrangements instituted, and, in short, the entire medical police established throughout, have proved of inestimable value in preventing the introduction and spread of epidemic and infectious diseases.

It would seem to be almost out of place, in this report, to allude in any manner to the extraordinary and praiseworthy services bestowed upon the sick and wounded soldiers, who have been the recipients, from time to time, of these hospitals, by all classes of our citizens. I cannot refrain from noticing more especially the commendable and the disinterested devotion of the ladies, who have contributed so largely to the alleviation of the sufferings of these noble men, by their personal attendance, and have distributed with a liberal hand supplies and delicacies of every description, with a kindness and earnestness which belong alone to woman.

Through the politeness of the surgeons in charge of the government hospitals located in our city, I have been able to furnish the number of cases under treatment, as well as the number of deaths during the year—or, from the date of their opening up to the 31st of December, 1862, as follows:—

Opened in 1862.	Location.	Surgeons.	Cases.	Deaths.	Per ct.	Deaths to cases.
Jan. 1st	Broad Street[1]	Dr. John Neal	3,206	89	2.50	1 in 36
June 1st	W. Philadelphia	" Hayes	5,156	164	3	1 in 31½
March 9th	South Street[2]	" Hart	1,163	47	4	1 in 25
"	5th & Buttonwood	" Bournonville	1,665	78	4.75	1 in 21
March 5th	Wood Street	" Horner	1,021	22	2	1 in 46
Aug. 19th	Filbert Street	" Breed	967	16	2	1 in 60
Jan. 1st	Christian Street	" Reese	964	40	4	1 in 24
June 18th	Master Street	" Goddard	953	43	4.50	1 in 22
Sept. 3d	Race Street	" Burpee	828	9	1	1 in 92
March	St. Joseph's	" Moon	713	29	4	1 in 24
July 5th	Germantown	" Darrach	651	4	.50	1 in 257
July 30th	Episcopal	" Thomas	531	33[3]	7	1 in 16
"	4th & George	" Harlow	527	46	9	1 in 11½
Aug. 18th	Hestonville	" Agnew	301	4	1	1 in 75
"	12th & Buttonwood	" Morton	257	1	0.39	1 in 163
Nov. 2d	Haddington	" Levis	191			
"	Turner's Lane	" E. S. Dunster	606	17	2.75	
March 1st	Summit House	" Sergeant	773	32	4	1 in 24
July 11th	Catharine Street	" Picot	199	8	4	1 in 25
"	Broad & Prime	" Kenderdine	270	35[3]	13	1 in 7
"	Islington Lane	" J. V. Patterson	17	1		1 in 17
"	Camac's Woods	" W. M. Camac	14			
			20,973	718	3.39	1 in 44
	Cooper Shop	" Nebinger		8		
	Union Hospital	" Ward		14		

From this record it will be seen that 20,973 medical and surgical cases have been treated in these hospitals, with a loss by death of only 718, or 3 per cent., and as one death in every 44 of the cases.

When all the unfavourable circumstances surrounding these sick and wounded soldiers from the date of their injuries on the battle field, or their sickness in camp, their exposure and sufferings, from the want of timely surgical and medical attention, the distance they were conveyed by land and water carriage, and the unpromising condition in which many of them were found upon their arrival at the hospital to which they were conveyed, some of whom were moribund, and quite a number dying on that or the following day—the wonder is, that the percentage of mortality among them was not far higher. No stronger evidence could be produced of the skilful manner in which the medical and surgical treatment in the government hospitals of our city has been conducted, than this limited percentage of deaths.

Estimating the population of the city at 600,000, and the aggregate deaths on record 15,097, as represented in Table No. 4, which includes 711 stillborn children, and 1202 deaths of soldiers, which do not properly belong to our city mortality, and it gives us one death in every 40, or twenty-five deaths in every 1000 of the population.

By deducting the stillborn and the deaths of soldiers which I have designated as of foreign origin, and the result presents a more favourable estimate; one death in every 45 of the population, and twenty-two in every 1000.

[1] The regular treatment did not commence until June 1. [2] Opened in 1861.
[3] Many of these were moribund when brought from the cars.

Of the sexes the rate of mortality has been 8315 males, and 6782 females. This is an unusual excess of male deaths, equal to 1523 or 23 per cent., amounting to more than double the ordinary excess of deaths among males, and may be properly attributed to the large number of the remains of soldiers brought here for burial, and of those who expired in the U. S. hospitals in our city.

The adult deaths were 7059; the minors or children 8038. This excess of deaths in minors, or those under twenty years of age, has been unusually small, not over 14 per cent. Last year it reached 64 per cent. The highest number of deaths in any one period of life, was among infants under one year. They amounted to 3661 (including the stillborn) equal to 23 per cent. of all the deaths. Those under five years numbered 6626, equal to 44 per cent.

By reference it will be found that these figures fall considerably below those of the previous year. This difference is owing mainly to the decline of deaths from smallpox, scarlet fever and diphtheria.

The number of adult deaths compared with those of minors is a very prominent feature in this report. Those between 20 and 40 years amounted to 3336, or 48.50 per cent. above those in the same period for 1861. Those between 40 and 70 were 2666, or 18.69 per cent. more than those in 1861. From seventy upwards to extreme old age, the deaths were 1057, or 18.69 per cent. over those in 1861; the variation, though not very great, is sufficient to prove that some extraordinary influence was at work to effect the change.

The same outside cause, to which I have already adverted—the mortality in the army of the United States, will in a great degree account for these results.

MONTHLY MORTALITY.—The deaths for several months throughout the year are given in the accompanying table.

Return of Deaths in each Month, showing the number of Deceased Males and Females, Adults and Children, for the year 1862.

1862. Months.	Males.	Females.	Adults.	Children.	Total.
January	664	650	557	757	1,314
February	576	504	460	620	1,080
March	601	603	531	673	1,204
April	660	553	586	627	1,213
May	685	660	653	692	1,345
June	551	451	480	522	1,002
July	966	801	649	1,118	1,767
August	1,061	594	803	952	1,755
September	573	464	490	547	1,037
October	754	481	676	559	1,235
November	570	451	549	472	1,021
December	654	470	625	499	1,124
	8,315	6,782	7,059	8,038	15,097
	15,097		15,097		

The greatest number of deaths in any one month was in July, which furnished 1767, while August contributed 1755. June gave the lowest, 1002, and November the next, 1021.

The deaths in every month exceeded 1000, and have been more equally distributed than usual.

The month of May, generally a healthy period of the year, gave 1345 deaths—the third in numerical order of mortality.

The months of October, November and December, furnished a heavier mortality among adults than in children, equal to 20 per cent. This is an uncommon occurrence, and can only be accounted for by the deaths among soldiers.

MORTALITY IN WARDS.—The following table presents the deaths in each of the twenty-four wards, with the population of each ward according to the last census. The ratio of deaths to population calculated in this table, will differ from that elsewhere given, as it is based on the census of 1860, instead of reckoning the natural increase of the population.

TABLE IV.—*Mortality in each Ward, with the Population (according to the late Census), the ratio of Deaths to Population, the Percentage of Deaths in each Ward to the Total Mortality, and Deaths in each thousand of the Population. Also the Deaths from unknown Wards, from the Almshouse and from the Country.*

WARDS.	Population last census.	Deaths.	Deaths to population.	Per cent. of deaths to total mortality.	Deaths in each thousand of population.
First	30,886	1,037	1 in 30	6.86	33.48
Second . . .	29,123	827	1 " 36	5.47	28.51
Third	19,929	491	1 " 41	3.25	24.55
Fourth . . .	23,461	711	1 " 33	4.70	30.87
Fifth	24,792	520	1 " 48	3.44	20.80
Sixth	14,882	350	1 " 43	2.31	23.33
Seventh . . .	31,267	829	1 " 38	5.49	26.74
Eighth . . .	27,770	465	1 " 60	3.08	16.60
Ninth	17,196	338	1 " 51	2.23	19.88
Tenth	21,849	599	1 " 37	3.96	27.27
Eleventh . . .	16,681	384	1 " 44	2.54	22.58
Twelfth . . .	16,681	429	1 " 39	2.84	25.23
Thirteenth . .	20,045	380	1 " 53	2.51	19.00
Fourteenth . .	24,258	493	1 " 50	3.26	20.54
Fifteenth . . .	32,091	819	1 " 40	5.42	25.59
Sixteenth . . .	20,067	520	1 " 39	3.44	26.00
Seventeenth . .	23,264	677	1 " 35	4.48	29.43
Eighteenth . .	20,441	596	1 " 35	3.94	29.80
Nineteenth . .	38,828	1,042	1 " 38	6.90	26.71
Twentieth . .	29,963	736	1 " 41	4.87	24.53
Twenty-first . .	17,159	284	1 " 61	1.88	16.70
Twenty-second .	17,173	286	1 " 61	1.89	16.82
Twenty-third .	23,985	329	1 " 73	2.17	13.70
Twenty-fourth .	23,738	660	1 " 36	4.37	27.50
Twenty-fifth . .	.....	130	.....	0.86	.....
Unknown . . .	.....	135	.....	0.89	.....
Almshouse . .	.....	508	.....	3.36	.....
From the country	.....	522	.....	3.59	.....
Total for 12 mos.	.....	15,097		100.00	
Total population	565,529				
Ratio of deaths to population		.....	1 in 38		

The first ward, this year, furnishes the highest number of deaths according to its population, 1037, and the twenty-third the lowest, 329. The former giving 33 and the latter 13 in every thousand of their population.

The first ward therefore appears to have been the most unhealthy, and the twenty-third the healthiest.

The deaths in the nineteenth ward are reduced a fraction less than in 1861, and although charged with 1042 deaths, it rates the eighth in the line of descent from the first ward, the most unhealthy, the deaths being 26.71 in every thousand of its population.

The seventeenth ward last year gave 36 deaths to every thousand of its population, and was rated the most unhealthy. This year it contributes only 29.80 to each thousand, and stands the fourth in numerical order from the first, the most unhealthy.

The five most unhealthy wards, all of them crowded and defective in sanitary improvement, have been the first, fourth, eighteenth, seventeenth and second, in the order named. They have furnished 32 per cent. of all the deaths for the year.

These are the same found grouped together in last year's report as the most unhealthy—substituting, however, the second for the nineteenth, and taking its place as the fifth in the line of descent from the most unhealthy.

There has been an increase in the number of deaths recorded, over those of the former year 1861—in fifteen of the wards, while in the ninth, eleventh, thirteenth, sixteenth, seventeenth, nineteenth, twentieth, twenty-first and twenty-third, they have fallen off.

The eighth ward, with its 27,770 inhabitants, continues to present a very favourable record for health. Furnishing only 1 death in every sixty, or 16 deaths in every thousand of its population, while its adjoining ward on the south, the seventh, with a population of 31,267, contributes 1 death in every 38, or $26\frac{7}{10}$ in every thousand of its population. This unfavourable contrast with its northern neighbor, can readily be accounted for by the numerous imperfections that will be found to exist in its sanitary condition, particularly in its eastern, southern and south-western sections.

The ninth, thirteenth and fourteenth wards, with their combined population of 61,499, present also a very favourable record. They return 1 death to 51, or 19.80 in every thousand of their population.

ZYMOTIC DISEASES.—This class embraces those which belong to epidemics, endemics, and contagious diseases, and have their origin in causes which are specific and local, and considered as preventable wherever a careful attention is given to sanitary improvements. These are the diseases which carry off so many of our infant population, especially among the indigent, and those who are compelled to rear their offspring in the crowded sections of the city, where the provision for ventilation, light, and other sanitary arrangements, is defective in the extreme. The deaths from the diseases under this head, as may be seen by the accompanying table (Table V.), have amounted to 3506. Compared with those of 1861, the previous year, and they are less by 558, or 16 per cent.

TABLE V.—*Zymotic, Epidemic, Endemic, and Contagious Diseases, for* 1862.

Division 1. *Showing Sex and Age.*

| DISEASES. | TOTAL. | SEX. | | | AGES. | | |

TABLE V.—*Zymotic, Epidemic, Endemic, and Contagious Diseases for* 1862—Continued.

Division 2. *Showing Location, Colour, Nativity, and Wards.*

DISEASES.	ALMSHOUSE.	PEOPLE OF COLOUR.	COUNTRY.	NATIVITY.			WARDS.																						UNKNOWN WARDS.
				United States.	Foreign.	Unknown.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Cholera	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" infantum	2	20	10	623	5	1	64	37	26	22	11	13	41	16	9	17	20	19	14	18	30	25	32	18	54	43	13	13	16	28	12	8
" morbus	..	3	3	33	21	4	4	7	2	3	2	..	3	2	1	3	2	1	1	2	2	2	3	3	5	1	1	1	2	1	1	..
Diarrhœa	39	12	14	243	65	109	15	24	9	14	9	5	17	5	6	15	8	6	4	2	11	22	14	23	39	15	9	2	10	112	6	1
Diphtheria	..	6	16	299	13	13	11	16	7	12	13	9	15	11	12	12	6	14	10	19	22	5	9	12	26	15	..	13	20	12	5	3
Dysentery	1	5	6	103	38	22	17	12	2	7	2	3	22	3	2	4	2	5	2	3	7	4	7	7	10	6	3	6	4	14	..	3
Erysipelas	8	3	3	57	9	8	5	5	1	1	2	1	4	4	1	3	2	2	2	2	4	5	1	3	4	5	..	1	..	12	..	1
Fever, congestive	..	..	1	4	3	2	1	1	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	2	1	..	..	..	1	..	..
" intermittent	..	1	1	4	2	1	1	..	..	..	1	..	..	..	..	..	1	..	..	..	1	..	1	..	..	1	..	..	..	..	..	..
" eruptive	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
" malignant	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
" remittent	1	2	3	35	13	6	2	2	2	..	..	2	2	1	1	2	3	..	2	..	4	2	6	3	2	4	3	2	1	4	1	..
" scarlet	7	7	17	440	3	18	30	30	22	19	14	9	36	19	10	13	7	9	15	23	44	12	17	19	22	20	6	46	2	38	2	2
" typhoid	3	16	68	396	127	135	34	34	11	17	14	12	45	12	7	48	11	41	18	13	25	25	17	20	51	42	17	8	16	42	8	2
" typhus	..	1	1	22	15	..	..	4	3	..	2	..	1	1	1	1	..	1	..	..	3	..	3	2	8	4	..	..	1	..	..	1
" yellow	..	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hooping cough	..	19	7	204	1	3	4	12	7	10	12	7	16	10	3	8	3	2	7	11	10	2	15	7	15	18	5	7	3	6	1	..
Measles	1	2	2	104	1	4	8	7	6	7	2	4	6	4	2	2	8	2	3	2	7	5	3	1	9	4	..	1	9	5	..	..
Smallpox	..	4	1	236	17	11	39	25	12	11	6	2	9	4	6	3	12	5	3	5	10	12	13	6	24	13	15	12	1	7	4	4
Syphilis	13	2	..	14	..	7	1	..	..	1	2	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	14	..	..
Thrush or aphthæ	..	..	1	4	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Varicella	..	..	..	2	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	75	103	155	2825	336	345	238	216	112	125	92	68	219	93	61	132	86	107	81	100	181	122	141	125	271	193	72	71	85	296	40	23

There are, however, 526 of these deaths[1] that do not belong to our city mortality, having been brought here from the army. By deducting these, the deaths under this head will be reduced to 2980, or 1084 less than the former year, equal to 26.50 per cent.

To the total of deaths for the year, from all causes, these rate as 23 per cent., or one in every 4 and a third.

The falling off in the deaths from scarlet fever, smallpox, and diphtheria, has been 1050 from those in 1861.

This amount, however, has been made up in a great measure by the large increase of deaths from typhoid fever and diarrhœa. The former rose from 281, in 1861, to 658, and the latter from 183 to 417.

The heavy increase of mortality in these diseases can only be ascribed to deaths in the government hospitals, and to those brought here from the seat of war for interment.

The only disease named in this class, that has been increased in its mortality to any extent, over that of the former year, and cannot be attributed to foreign origin, has been hooping-cough, which has run up to 208 from 93. In every other disease, with the exception of those already named, there has been very little change.

Cholera infantum, as usual, has provided 629 deaths for the record, and unlike many other diseases where the deaths are distributed over the entire year, its mortality is confined to the three summer months of July, August, and September, at the same time selecting 327 or 50 per cent. of its innocent victims from the first, second, third, seventh, fifteenth, nineteenth and twentieth wards, which may be considered by far the most crowded and the most unsanitary sections of the city.

[1] The following catalogue has been obtained from the Registration Office. It gives the names of the diseases and casualties on the certificates of death of those soldiers of our army who have been buried in this city during the year 1862:—

Typhoid fever,	263	Dropsy,	9	Inflammation of heart,	1
Wounds, gunshot,	292	Congestion of bowels,	1	Congestive fever,	1
Disease of the heart,	11	Tuberculosis,	4	Dyscrasia,	1
Peritonitis,	7	Congestion of lungs,	1	Erysipelas,	4
Diphtheria,	16	Disease of kidneys,	2	Scurvy,	3
Apoplexy,	5	Ossification of aortic valve,	1	Bronchitis,	3
Intermittent fever,	2			Cholera morbus,	2
Pleuro-pneumonia,	9	Compression of brain,	1	Marasmus,	4
Typhoid pneumonia,	24	Abscess,	4	Palsy,	1
Drowning,	3	Pleurisy,	3	Hepatitis,	1
Consumption,	88	Scarlet fever,	1	Larynx,	1
Brain fever,	3	Rheumatism,	1	Concussion of brain,	2
Pneumonia,	23	Jaundice,	1	Gastric fever,	1
Inflammation of bowels,	3	Dysentery,	40	Parotitis,	1
Debility & exhaustion,	34	Gangrene,	6	Tetanus,	1
Convulsions,	3	Tonsillitis,	1	Effusion on brain,	1
Ossification of arteries,	1	Remittent fever,	7	Scrofula,	1
Inflammation of brain,	6	Disease of lungs,	1	Epilepsy,	2
Congestion of heart,	1	Pyemia,	15	Murder,	1
Ulceration of bowels,	4	Bilious fever,	1	Scrofula,	1
Intemperance,	3	Falling from a window,	1	Softening of the brain,	2
Dropsy of the chest,	1	Diarrhœa,	177	Consumption of stomach,	1
Measles,	3	Softening of brain,	1	Trismus,	1
Variola,	7	Accidents on railroad,	13	Mania-a-potu,	1
Congestion of the brain,	14	Fever, pernicious,	1		
Gastro-enteritis,	8	Sunstroke,	1	Total,	1,202
Unknown,	35				

Scarlet fever, smallpox, and diphtheria have prevailed during the year, but not to an alarming extent. During the first quarter, they furnished 437 deaths; in the second, 244; in the third, 154, and in the fourth, 215. These figures show a considerable decline in the second and third quarters, and although there was a slight increase in the fourth, they present a falling off of one-half from the first quarter. Smallpox fell off from 152 in the first quarter to 22 in the fourth. Scarlet fever, in the same period, from 189 to 92.

Diphtheria, however, appears to have increased during the last quarter. The first gave 96 deaths; the second, 56; the third, 72; while the fourth run up to 101.

TABLE A.—*Wards in which Zymotic or Epidemic Diseases were prevalent and deaths over* 150.

WARDS.	Population.	Total deaths.	Deaths from zymotics.
1	30,886	1037	238
2	29,123	827	216
7	31,264	829	219
15	32,091	819	181
19	38,828	1042	271
20	29,963	736	192
24	23,738	660[1]	221
	215,893	5950	1538
From country			155
			1693

TABLE B.—*Wards in which Zymotic or Epidemic Diseases have not prevailed extensively, and where the deaths were under* 150.

WARDS.	Population.	Total deaths.	Deaths from zymotics.
3	19,929	491	112
4	23,461	711	125
5	24,792	520	92
6	14,882	350	68
8	27,770	465	93
9	17,196	338	61
10	21,849	599	132
11	16,681	384	86
12	16,681	429	107
13	20,045	380	81
14	24,258	493	100
16	20,067	520	122
17	23,264	677	141
18	20,441	596	125
21	17,159	284	72
22	17,173	286	71
23	23,985	329	85
25		130	40
Unknown		135	25
	349,643	8117	1738
Almshouse			75
			1813

The above tables have been prepared in order to furnish some idea of the healthy and unhealthy localities or wards in the city.

[1] Less those from almshouse 508.

In my last year's report I presented similar tables, in which the one marked A, analogous to that in this report, enumerated eleven wards, where deaths from epidemic diseases had exceeded one hundred and fifty. The table A, given above for 1862, recapitulates only six of these wards, the first, second, seventh, fifteenth, nineteenth and twentieth, to which I have added the twenty-fourth, where the deaths from zymotics were above one-hundred and fifty.

The decline of deaths from zymotic or preventable diseases in the remaining five of the eleven wards, as presented in table A, 1861, viz: the fourth, eleventh, sixteenth, seventeenth and eighteenth, may serve as an indication of the improved state of health in the city; nor have I any doubt, had it been practicable to have secured the deaths from zymotic diseases that have occurred in the government hospitals in our city, there being one in each of the above seven wards, and those that have been brought into the city from the seat of war and other places and buried from these wards, and deducted them from the total of deaths properly belonging to these wards, the figures would stand considerably below one hundred and fifty in each, making such a table unnecessary and effecting a sensible change in the index that pointed out these wards as the most unhealthy.

Table B embraces the remaining eighteen wards, together with the deaths from unknown wards. An average of the total of deaths in these eighteen sections—uniting the twenty-fifth and the unknown in one—will give 450 for each ward, while an average of the other seven wards makes the deaths 850 in each; thus showing the mortality to be nearly double. If we average the deaths from zymotic diseases in the seven wards, it returns 219 for each, and in the eighteen, the average will be 96 deaths.

This may not be the most accurate test of the health of one ward over another, as there may exist causes modifying unfavourably the mortality in one section over that of another, foreign to its sanitary condition, yet enough is learned to enable us to discriminate between the healthy and unhealthy districts.

The twenty-first, twenty-second and twenty-third wards, which are suburban, and to a large extent rural, furnished as high a rate of deaths from zymotic diseases as did several of the intramural wards with an equal population, and surrounded by far more adverse influences, incident to a residence in a crowded city. The cause of this mortality may be ascribed to the existence of malaria, which is to be found in most of the rural districts adjacent to our built up wards, where, during the autumnal season, there is abundance of decaying vegetable matter, together with numerous small sluggish streams of water and stagnant pools, on the unimproved lots, that create disease of an endemic character.

The fifth, eighth, ninth and twenty-third wards appear to have given only three deaths, from zymotic diseases, in every thousand of their population; the sixth, thirteenth, twenty-first and twenty-second wards contributed four in every thousand, while the remaining sixteen of the twenty-four, furnished a still higher proportion. It may, therefore, be assumed with entire safety, that the above named wards present a very favourable character for health, in comparison with other sections of the city. Three of them, it may be observed, are classed as rural districts.

The fact must not be overlooked that a large proportion of the deaths from this class of diseases, as a general rule, fall upon children and infants under five years of age. During the year under consideration, 1928 were

of this description, equal to 55 per cent. of the entire mortality. Of this number 784, or 22 per cent., were under one year of age.

The principal diseases of which these children died, were cholera infantum, diphtheria, diarrhœa, scarlet fever, hooping-cough, measles and smallpox.

Of this latter disease, there were in all 264 deaths, and of these 196, nearly two-thirds, were in children under ten years of age. This fact furnishes a strong appeal as to the necessity of an obligatory law for vaccination.

The deaths from smallpox were most numerous in the first, second, and nineteenth wards.

The deaths from diphtheria were distributed very generally through the city, except in the eleventh, sixteenth and twenty-first wards. The first two gave 6 and 5, but in the last named not a death is recorded.

Hooping-cough has prevailed to a greater extent during the year than usual. The first and the third quarters, the coldest and warmest seasons of the year, furnished the highest number of deaths.

The mortality for the year reached 208. This is the largest number of deaths that has ever been recorded in this city for any single year. In 1839 they reached 191, and in 1842, 197. Every other year, with the exception of 1844 and 1846, when they rose to 101 and 104, the mortality was quite small.

Measles has also been on the increase. The deaths having amounted to 109. Like diphtheria, the disease appears to have been very general through the city, if the deaths will serve as an index, but in the twenty-first, a rural ward, there is not a death recorded. There were four deaths in adults, three between 10 and 15 years, and the remainder under 10.

I have intentionally omitted the tables heretofore constructed, which designate the different varieties of sporadic diseases, and separate them into classes, according to the particular organs or parts of the system involved. In making minute investigations these tables are certainly useful, but as the diseases by name are to be found alphabetically arranged in the general table of deaths marked No. VI., they can be referred to for general purposes, and subdivided by those who take a special interest in mortality statistics.

In place of these classified divisions, I offer the following table of the most fatal sporadic causes of death which have occurred during the year, as well as during the previous year 1861. Inserting those causes only that rate above fifty in 1862, and comparing them with those of 1861.

Deaths from Sporadic Causes in 1862, *compared with those from similar causes in* 1861.

	1861.	1862.		1861.	1862.
Abscess	47	52	Gangrene	46	55
Apoplexy	162	176	Hemorrhage	72	82
Burns and scalds	81	81	Inflammation of Brain	305	365
Cancer (different varieties)	189	181	" of Bronchi	138	116
Casualties	122	135	" of Lungs	681	749
Croup	304	258	" of Peritoneum	67	87
Congestion of Brain	275	324	" of Stomach & Bowels	238	306
" of Lungs	110	147			
Convulsions	636	703	Inanition	124	125
Consumption of the Lungs	1817	1949	Intemperance	29	82
Dropsy	284	236	Marasmus	533	643
" of Brain	222	200	Mania-à-Potu	32	57
" of Chest	63	55	Old Age	203	219
Disease of Brain	112	98	Palsy	159	164
" of Heart	265	242	Scrofula	76	74
Debility	826	940	Stillborn	758	711
Drowned	99	135	Unknown	104	97
Effusion of Brain	73	69	Gunshot Wounds	21	292

With few exceptions it will be observed that there is a degree of uniformity in the deaths from various causes, and this order is not peculiar to these two periods, it may be seen in the mortality of one year with another, in our own bills of mortality, likewise in those of other cities for a succession of years, and is only disturbed by an increase or decrease of the population.

The most marked inequality in any one cause between these two years is presented in that of gun-shot wounds, which figures 292 in 1862, and only 21 in 1861, which at that time was considered an extraordinary number. It needs no argument to prove from whence came this remarkable increase.

Another exception is that of debility, in which there is an increase of 110 in 1862, as also of consumption of the lungs, 132; intemperance, 53; inflammation of the lungs, 68; inflammation of the brain, 60; congestion of the brain, 40. Many of these may be traced directly to the record of causes for deaths among soldiers.

The similarity, as shown in this table, between the causes of death for the two years is remarkable in apoplexy, burns and scalds, casualties, diseases of the brain, debility, effusion of brain, inanition, old age, palsy, scrofula, cancer, and unknown.

The proportion of deaths by consumption to those of other diseases, has been one in 7½, and the percentage to all other deaths 12.71.

To the population, estimating it at 600,000, they were as one in every 308.

The excess of deaths is with females. The most prevalent age for deaths from consumption is between twenty and thirty. It carried off in 1862 in this decennial 608 persons. More than one-half of all the deaths occurred between the ages of fifteen and forty.

The first, second, fourth, seventh, tenth, fifteenth, nineteenth and twentieth wards are charged with 881 deaths from consumption, more than one-half the entire mortality, and these wards are with but one exception the tenth among the most unfavourable for health.

The almshouse furnished 124 deaths, and the coloured population is set down for 149 deaths from consumption.

The mortality assigned to debility, intemperance, mania-a-potu and in-

flammation of the brain, have all increased more or less, while on the other hand croup, dropsy (general and of the brain and chest), and disease of the heart have shown a moderate decline.

There are to be found certain variations in the mortality record for 1862 from that of 1861, and even of earlier years, which depend in some measure upon the rebellion and its results, that are deserving of a passing notice. They are as follows :—

1. The increase in the annual aggregate of deaths, without the prevalence of any unusual epidemic.

2. The unusual mortality among males, as compared with those of females, equal to 23 per cent., and presenting an excess more than double the usual number.

3. The limited proportion of deaths of minors or children to those of adults, not over 14 per cent. The previous year they exceeded 64 per cent.

4. The astonishing increase in the deaths from gun-shot wounds. From 21 of the preceding year to 292 !

5. The increased mortality from typhoid fever, amounting to 658, or 477 above those of 1861, equal to 170 per cent. The excess in all probability was from the deaths of soldiers.

6. The falling off in the deaths from scarlet fever, smallpox, and diphtheria, when compared with those for 1861, amounting in the aggregate to 1397, or 57 per cent.

7. The unusual annual increase in the deaths from consumption of the lungs and debility. The former amounting to 132 or 7 per cent., and the latter to 112 or 13 per cent.

8. The large number of the remains of soldiers brought into our city for interment, amounting to 1202, causing our rate of mortality to appear higher by 4 per cent. than belongs to it.

9. The organization of 22 government hospitals in our city, where there have been treated during the year 20,336 sick and wounded soldiers from the seat of war, thus swelling our list of city deaths—one for every death in these hospitals amounting to 700.

TABLE VI.—*Interments in the City of Philadelphia from December* 28, 1861, *to January* 3, 1863.

Division 1. *Mortality classified according to Sex and Age.*

DISEASES.	TOTAL.	SEX.				AGES.													ADULTS.	MINORS.
		Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	110 to 120.		
Abortion	3	2	1	2	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Abscess	52	30	22	7	4	2	2	2	2	1	2	9	11	9	4	6	1	1	..	..	..	41	11
Albuminuria	10	85	5	1	..	..	..	..	..	1	..	1	2	1	1	2	1	..	..	..	..	9	1
Anæmia	20	12	8	8	4	9	..	2	..	1	..	2	1	..	3	1	1	1	..	..	..	8	12
Aneurism	13	11	2	..	..	..	..	..	..	..	..	1	2	5	2	3	..	..	..	..	..	13	..
Anthrax	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
Angina pectoris	11	8	3	..	1	..	..	..	..	1	..	..	1	..	..	5	1	..	..	..	..	10	1
Amputation	4	4	..	2	..	..	..	..	1	..	1	2	..	..	3	..	..	..	..	..	..	2	2
Aphthæ	4	2	2	2	2	3	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Apoplexy	176	93	83	6	3	2	..	1	..	..	6	9	12	30	33	39	34	10	..	..	..	167	9
Asphyxia	35	18	17	16	14	28	..	2	..	..	..	1	1	1	1	..	1	..	..	..	..	5	30
Asthma	24	15	9	4	1	2	1	1	1	..	..	..	..	..	6	3	9	1	..	..	..	19	5
Burns and scalds	81	38	43	25	34	3	7	27	9	3	10	9	7	2	1	1	2	..	..	..	..	22	59
Cancer	70	28	42	2	2	1	..	..	2	..	1	3	7	15	16	14	8	3	..	..	..	66	4
" of the breast	12	..	12	..	..	..	..	..	..	..	..	..	..	3	2	5	2	..	..	..	..	12	..
" " chest	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..
" " heart	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..
" " neck	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
" " ovaries	1	..	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
" " stomach & bowels	65	31	34	5	..	..	2	3	..	..	..	2	4	11	15	17	8	3	..	..	..	60	5
" " uterus	30	..	30	..	..	..	..	..	..	..	..	..	5	6	17	2	..	..	..	..	..	30	..
Casualties	135	116	19	36	7	1	3	9	9	7	14	29	17	15	17	8	4	2	..	..	..	92	43
Croup	258	137	121	134	119	31	53	133	23	1	2	1	..	..	1	2	1	..	..	..	..	5	253
Congestion	3	2	1	2	..	1	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	1	2
" of the brain	324	169	155	103	116	77	47	40	28	9	9	23	28	20	13	11	8	2	..	..	..	105	219
" " bowels	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..
" " heart	2	1	1	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	2	..
" " liver	10	5	5	..	1	..	..	1	..	..	..	..	1	2	..	3	3	..	..	..	..	9	1
" " lungs	147	83	64	53	40	42	17	15	12	3	4	7	9	7	6	12	11	1	1	..	..	54	93
Convulsions	703	361	342	339	324	306	115	119	28	6	..	11	13	7	4	3	2	..	..	..	..	40	663
" puerperal	46	..	46	..	3	..	..	..	..	..	3	24	16	3	..	..	..	..	..	..	..	43	3
Consumption of bowels	23	10	13	6	5	2	3	1	1	..	4	3	4	1	1	1	1	1	..	..	..	12	11
" lungs	1949	961	988	124	169	45	27	36	32	26	127	608	445	269	172	103	51	8	..	..	..	1656	293
Carbuncle	5	3	2	..	2	..	1	1	..	..	..	1	..	1	1	..	..	..	..	..	..	3	2
Compression of the brain	11	6	5	2	2	1	..	1	1	1	..	1	2	..	1	2	1	..	..	..	..	7	4
Cyanosis	40	25	15	25	15	39	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	40
Cirrhosis	15	9	6	1	1	1	..	..	1	..	..	..	1	5	3	3	1	..	..	..	..	13	2

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 1. *Mortality classified according to Sex and Age.*

DISEASES.	TOTAL.	SEX.				AGES.														ADULTS.	MINORS.
		Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	110 to 120.		
Concussion of the brain	13	11	2	4	2	1	..	..	2	1	2	3	1	1	..	2	..	..	..	..	..	7	6
Cholera asphyxia	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..
" infantum	629	321	308	321	308	428	170	31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	629
" morbus	58	26	32	6	5	4	3	..	1	3	..	4	3	4	6	10	12	3	..	..	..	47	11
Cramps	17	9	8	9	7	13	..	1	1	..	1	..	1	..	..	..	..	..	..	..	..	1	16
Caries of spine	6	3	3	2	2	..	..	..	2	2	..	1	1	..	..	..	..	..	..	..	..	2	4
" bones of the face	1	1	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Chicken-pox	2	..	2	..	2	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Contusion of chest	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..
Colic	6	3	3	1	2	2	..	..	..	1	..	..	..	..	..	1	1	..	..	..	..	3	3
Coxalgia	7	3	4	1	4	..	..	..	1	2	2	..	..	1	1	..	..	..	..	..	..	2	5
Constipation	2	1	1	..	1	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	1	1
Coryza	1	..	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Coup de soleil	24	22	2	1	..	..	..	..	..	1	..	4	7	7	1	4	..	..	..	..	..	22	1
Diphtheria	325	152	173	132	169	26	54	125	77	10	9	15	5	1	2	..	1	..	..	..	..	24	301
Dropsy	236	96	140	35	21	4	2	25	12	8	5	12	27	23	33	40	27	15	3	..	..	180	56
" abdominal	26	13	13	1	..	..	..	..	1	..	..	2	6	4	4	6	3	..	..	..	..	25	1
" of the brain	200	100	100	98	99	97	56	37	3	3	..	..	1	..	1	1	..	..	..	..	..	3	197
" " chest	55	34	21	10	4	..	1	5	5	3	..	6	4	4	13	6	7	..	1	..	..	41	14
" " heart	45	24	21	5	7	1	..	4	2	3	2	3	5	5	6	6	7	1	..	..	..	33	12
" " ovaries	4	..	4	..	..	..	..	..	..	..	..	..	1	..	2	..	1	..	..	..	..	4	..
" " stomach	3	3	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1	..	..	..	..	3	..
Disease of the brain	98	48	50	28	35	21	18	17	5	2	3	7	6	5	6	5	5	1	..	..	..	35	63
" " bladder	7	6	1	..	..	..	..	..	..	..	..	..	..	1	2	1	2	..	..	..	..	5	..
" " chest	5	5	..	..	..	..	..	..	..	..	..	1	1	2	1	..	..	..	..	..	..	5	..
" " heart	242	123	119	30	20	12	5	7	5	8	13	28	22	38	29	39	31	4	1	..	..	192	50
" " kidneys	31	17	14	1	1	..	..	..	..	..	2	5	4	6	3	5	6	..	..	..	..	29	2
" " lungs	20	10	10	2	7	3	1	3	1	..	1	2	2	1	3	2	1	..	..	..	..	11	9
" " liver	43	24	19	1	2	..	1	..	1	..	1	1	9	8	12	5	5	..	..	..	..	40	3
" " spine	22	6	16	4	12	6	..	1	5	2	2	..	2	1	1	2	..	..	..	..	..	6	16
" " glands	1	1	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
" " stomach & bowels	15	10	5	3	1	3	..	1	..	..	..	1	..	..	2	4	4	..	..	..	..	11	4
" " skin	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
" " throat	9	2	7	2	5	1	2	2	1	1	..	1	..	..	..	..	..	1	..	..	..	2	7
" " uterus	4	..	4	..	..	..	..	..	..	..	..	..	2	..	1	..	1	..	..	..	..	4	..
Diarrhœa	417	302	115	65	52	61	23	14	6	..	13	133	54	31	38	20	15	8	..	1	..	300	117
Debility	940	487	453	225	181	330	25	25	10	7	9	49	74	60	55	96	118	69	12	..	1	534	406

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 1. *Mortality classified according to Sex and Age.*

DISEASES.	TOTAL.	SEX.				AGES.														Adults.	Minors.
		Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	110 to 120.		
Dysentery	163	98	65	43	31	20	38	9	3	1	3	22	30	13	6	8	6	4	..	..	..	89	74
Drowned	135	118	17	47	11	1	..	4	20	17	16	18	27	22	7	3	..	..	..	..	..	77	58
Diabetes	10	5	5	1	..	..	..	..	..	..	1	1	4	1	1	1	1	..	..	..	..	9	1
Dyspepsia	2	1	1	..	1	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	1	1
Dislocation of spine	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
Dysuria	1	..	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Effusion of the brain	69	43	26	32	24	21	19	12	2	..	2	3	1	2	5	..	2	..	..	..	..	13	56
" " lungs	6	2	4	1	4	..	2	1	1	1	..	1	..	..	..	..	..	..	..	..	..	1	5
Epilepsy	28	19	9	..	3	..	..	..	1	1	1	11	7	4	2	..	..	1	..	..	..	25	3
Erysipelas	74	42	32	25	21	26	5	7	3	3	2	6	5	5	5	3	2	2	..	..	..	28	46
Emphysema of lungs	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	2	..
Enlargement of the heart	5	2	3	..	1	..	..	..	1	..	..	2	1	..	..	..	1	..	..	..	..	4	1
" " liver	5	4	1	1	..	..	1	..	..	..	..	1	1	1	..	1	..	..	..	..	..	4	1
" " prostate gland	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	1	..
Exposure	4	3	1	3	..	1	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	1	3
Empyema	1	..	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Ecthyma	1	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Fever	23	15	8	4	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	17	6
" bilious	18	11	7	4	7	1	..	..	1	1	3	6	5	3	3	..	..	..	..	..	..	7	11
" brain	8	7	1	1	..	..	1	2	2	2	2	2	3	2	..	..	..	..	..	..	..	7	1
" congestive	4	4	..	1	..	..	..	..	..	..	..	2	2	1	1	..	1	..	..	..	..	3	1
" camp	2	1	1	1	1	2	..	..	..	..	1	3	..	..	..	..	..	..	..	..	..	..	2
" catarrh	1	1	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" eruptive	7	3	4	1	2	..	2	1	..	..	..	1	..	1	..	1	1	..	..	..	..	4	3
" gastric	4	2	2	..	2	2	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	2	2
" hectic	7	4	3	..	2	1	1	..	..	..	..	3	2	..	..	..	..	..	..	..	..	6	2
" intermittent	23	..	23	..	..	..	..	..	..	..	..	8	13	2	..	..	..	..	..	..	..	23	..
" puerperal	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
" rheumatic	2	1	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	2	..
" malignant	24	9	15	3	11	1	3	6	2	..	2	5	..	..	1	3	..	1	..	..	..	10	14
" remittent	461	222	239	220	236	35	82	228	101	8	2	3	2	..	..	..	..	..	..	..	..	5	456
" scarlet	654	486	168	113	71	2	7	36	31	18	90	255	90	59	34	10	10	2	1	..	..	470	184
" typhoid	37	18	19	7	5	..	..	3	5	1	3	5	9	7	3	1	..	..	..	..	..	25	12
" typhus	2	2	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	2	..
" yellow	2	2	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	2	..
Fracture of the arm	2	2	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	2	..
" " leg	8	8	..	1	..	..	..	..	..	1	..	..	3	..	2	2	..	..	..	..	..	7	1

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 1. *Mortality classified according to Sex and Age.*

DISEASES.	Total.	SEX.				AGES.														ADULTS.	MINORS.
		Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	110 to 120.		
Fracture of the skull	11	9	2	2	1	..	..	1	1	..	1	3	..	4	1	..	..	..	..	..	..	8	3
" " shoulder	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
" " thigh	6	6	..	1	..	..	..	..	..	..	1	3	..	1	1	..	..	..	..	..	..	5	1
" " pelvis	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
Fistula	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	2	..
Fatty degeneration of heart	3	3	..	..	..	..	..	..	..	..	..	..	..	1	1	1	..	..	..	..	..	3	..
" " kidneys	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
" " liver	2	2	..	1	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1
Gangrene	55	27	28	6	9	3	4	3	2	1	2	6	1	5	6	9	8	5	..	..	..	40	15
Gout	5	4	1	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..	1	..	..	5	..
Gravel	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	2	..
Hernia	14	8	6	3	..	3	..	..	..	..	..	1	..	..	..	7	3	..	..	..	..	11	3
Hydrophobia	4	3	1	2	1	..	..	1	2	..	..	..	..	..	1	..	..	..	..	..	..	1	3
Hooping-cough	208	105	103	105	103	98	55	46	7	..	2	..	..	..	..	..	..	..	..	..	..	..	208
Hemorrhage	82	48	34	17	18	13	4	7	4	5	2	12	11	5	7	6	4	2	..	..	..	47	35
" of the lungs	21	11	10	1	2	1	..	..	..	1	1	4	9	1	2	1	1	..	..	..	..	18	3
" kidneys	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..
" stomach & bowels	8	5	3	..	..	..	..	..	..	..	..	..	2	2	..	3	..	1	..	..	..	8	..
" uterus	13	..	13	..	..	..	..	..	..	..	..	5	5	2	..	..	1	..	..	..	..	13	..
Inflammation	6	..	6	1	3	1	1	2	..	..	..	..	..	1	1	..	..	..	..	..	..	2	4
" of brain	365	218	147	180	138	91	78	89	39	15	6	10	14	17	2	2	2	..	..	..	..	47	318
" bronchi	116	57	59	37	29	34	20	10	1	..	1	3	8	8	7	12	7	5	..	..	..	60	56
" breast	1	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
" bladder	15	10	5	..	1	..	..	..	..	..	1	1	2	..	4	2	5	..	..	..	..	14	1
" chest	1	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" ear	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..
" heart	28	19	9	3	1	..	..	1	3	..	..	9	6	2	2	..	4	1	..	..	..	24	4
" kidneys	5	4	1	..	..	..	..	..	..	..	..	1	..	..	2	1	..	1	..	..	..	5	..
" lungs	749	413	336	241	241	212	115	117	22	6	10	64	46	44	33	41	27	12	..	..	..	267	482
" liver	38	18	20	..	2	..	..	2	..	..	..	4	6	12	7	4	2	1	..	..	..	36	2
" larynx	22	8	14	6	2	4	5	5	1	..	..	2	3	..	1	..	1	..	..	..	..	7	15
" peritoneum	87	41	46	13	8	5	2	4	1	5	4	20	18	7	9	6	3	3	..	..	..	66	21
" prostate gland	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..
" pleura	20	14	6	4	..	2	..	1	..	..	..	7	1	1	1	2	1	3	..	..	..	16	4
" parotid glands	5	2	3	1	3	1	..	2	1	..	..	1	..	..	..	..	..	..	..	..	..	1	4
" pharynx	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" stomach & bowels	306	148	158	72	73	64	32	24	15	6	4	34	31	31	25	23	15	5	..	..	..	161	145

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 1. *Mortality classified according to Sex and Age.*

DISEASES.	TOTAL.	SEX.				AGES.															ADULTS.	MINORS.
		Males.	Females.	B'ys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	110 to 120.		
Inflammation of spine	7	5	2	5	1	..	1	1	4	..	..	..	..	..	..	1	..	..	..	..	..	1	6
" spleen	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
" throat	1	..	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" tonsils	1	1	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" uterus	7	..	7	..	..	..	..	..	..	..	..	3	2	2	..	..	..	..	..	..	..	7	..
" veins	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
Inanition	125	73	52	51	30	77	2	3	1	1	6	14	6	3	3	3	6	..	..	..	..	35	90
Insanity	8	3	5	..	..	..	..	..	..	..	..	1	1	2	3	1	..	..	..	..	..	8	..
Jaundice	27	13	14	4	7	8	1	1	1	..	..	1	3	5	2	4	..	1	..	..	..	16	11
Intemperance and exposure	82	45	37	..	..	..	..	..	..	..	..	14	34	23	6	4	1	..	..	..	..	82	..
Icterus	6	1	5	..	5	4	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	1	5
Leucocythemia	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
Marasmus	643	356	287	329	264	326	150	90	21	5	..	4	6	5	7	16	11	1	..	1	..	51	592
Measles	109	61	48	57	48	17	45	33	7	3	..	4	..	..	..	..	..	..	..	..	..	4	105
Mania a potu	57	46	11	..	..	..	..	..	..	..	..	8	17	20	10	..	2	..	..	..	..	57	..
Malformation	20	13	7	13	7	19	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
Metastasis	1	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Melanosis	2	..	2	..	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	1
Neuralgia	10	4	6	..	..	..	..	..	..	..	..	1	1	2	2	2	1	1	..	..	..	10	..
Neglect	1	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Neurosis	6	2	3	1	..	..	..	1	..	..	..	..	2	2	..	..	..	..	..	..	..	4	1
Necrosis	2	1	1	..	1	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	1	1
Old age	219	69	150	..	..	..	..	..	..	..	..	..	..	..	4	10	57	105	39	4	..	219	..
Obstruction of the bowels	24	10	14	6	1	5	..	..	..	2	..	2	3	4	..	2	1	..	..	..	..	17	7
Overdose of ether	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
Ossification of the heart	8	5	3	..	..	..	..	..	..	..	..	1	..	..	2	2	1	2	..	..	..	8	..
" " aorta	4	3	1	..	..	..	..	..	..	..	..	1	..	..	..	2	..	1	..	..	..	4	..
Œdema of the glottis	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Palsy	164	74	90	4	..	..	..	1	2	..	1	5	9	15	26	30	51	17	7	..	..	160	4
Pyæmia	29	26	3	4	..	..	..	..	..	..	3	16	5	1	2	..	1	..	..	..	..	25	4
Purpura	6	4	2	2	1	1	..	1	1	..	..	..	2	..	1	..	..	..	..	..	..	3	3
Poisoning	6	4	2	2	2	2	..	..	1	..	1	..	1	1	..	..	..	..	..	..	..	2	4
Rupia	1	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Rheumatism	20	11	9	4	..	..	..	1	..	1	2	5	2	2	2	4	1	..	..	..	..	16	4
Rupture	1	..	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" of the uterus	3	..	3	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	3	..
" " aorta	2	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	2	..

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 1. *Mortality classified according to Sex and Age.*

DISEASES.	TOTAL.	SEX.				AGES.															ADULTS.	MINORS.
		Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to 110.	110 to 120.		
Scrofula	74	44	30	39	27	16	15	15	11	3	6	4	1	2	..	..	1	..	..	..	..	8	66
Smallpox	264	133	131	105	108	52	44	66	34	8	14	22	16	7	6	..	..	..	..	..	..	51	213
Softening of the brain	43	26	17	3	2	..	2	1	..	..	2	2	10	5	8	5	6	2	..	..	..	38	5
" " heart	1	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
Stillborn	711	414	297	414	297	711	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	711
Syphilis	21	13	8	12	4	11	4	1	..	..	..	1	2	1	1	..	..	..	..	..	..	5	16
Suicide	14	11	3	..	..	..	..	..	..	..	..	1	3	7	..	3	..	..	..	..	..	14	..
Suffocation	13	8	5	3	5	5	..	1	2	..	..	1	..	2	2	..	..	..	..	..	..	5	8
Stricture of the œsophagus	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..
" " pylorus	1	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..
" " glottis	1	..	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Strangulation	3	3	..	3	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Suffocating catarrh	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..
Syncope	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
Scurvy	5	5	..	..	..	..	..	..	..	..	..	3	..	2	..	..	..	..	..	..	..	5	..
Tumours	21	2	19	..	1	..	..	..	1	..	..	5	4	3	3	3	2	..	..	..	..	20	1
Tympanitis	2	1	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	2	..
Tetanus	27	19	8	11	6	4	1	..	5	3	4	3	2	2	1	1	1	..	..	..	..	10	17
Teething	41	23	18	23	18	20	20	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	41
Unknown	97	71	26	15	14	22	3	1	1	1	1	32	12	9	2	5	5	3	..	..	..	68	29
Ulceration	6	2	4	1	1	1	..	..	1	..	..	..	1	1	1	1	..	..	..	..	..	4	2
" of the bowels	21	13	8	2	4	1	2	1	..	1	1	..	5	7	2	1	..	..	..	..	..	15	6
" " bladder	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..
" " larynx	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..
" " stomach	3	2	1	2	..	..	1	1	..	..	..	..	..	1	..	..	..	..	..	..	..	1	2
" " throat	4	2	2	1	1	..	..	..	2	..	..	..	..	2	..	..	..	..	..	..	..	2	2
Violence	7	6	1	..	..	..	..	..	..	..	..	..	3	2	1	1	..	..	..	..	..	7	..
Wounds	3	2	1	2	..	..	..	..	1	..	1	..	..	..	..	..	..	1	..	..	..	1	2
" gunshot	292	292	..	42	..	..	..	1	..	..	41	192	40	14	3	1	..	1	..	..	..	250	42
Worms	3	1	2	1	2	..	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Total	15097	8315	6782	4266	3772	3661	1410	1555	679	233	500	1928	1408	1046	843	777	666	316	68	6	1	7059	8038

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

DISEASES.	ALMSHOUSE.	PEOPLE OF COLOUR.	COUNTRY.	NATIVITY.			WARDS.																								UNKNOWN WARDS.
				United States.	Foreign.	Unknown.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Abortion	..	..	..	3	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Abscess	4	2	3	30	14	8	2	3	2	2	3	3	3	3	4	3	1	2	1	..	1	1	1	1	1	3	..	..	..	9	..	..
Albuminuria	2	..	..	6	2	2	..	1	1	..	2	..	..	1	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	2	..	..
Anæmia	..	..	1	15	4	1	2	2	..	..	2	..	1	1	2	..	1	2	..	..	1	..	..	3	1	..	..	..	1	..	..	..
Aneurism	2	..	..	4	7	2	..	1	..	..	..	..	2	..	..	1	1	..	1	..	1	..	1	1	1	..	..	..	1	2	..	..
Anthrax	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Angina pectoris	..	1	1	6	5	..	2	..	..	1	..	..	..	..	..	1	..	1	2	2	..	1	..	..	..	..	..	..	..	..	..	..
Amputation	1	..	..	3	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..
Aphthæ	..	..	1	4	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	..
Apoplexy	10	5	11	80	32	14	11	10	3	4	4	4	7	7	5	6	7	7	1	7	6	6	9	9	8	9	5	3	9	17	1	..
Asphyxia	..	..	..	32	2	1	3	5	1	2	..	1	2	..	2	1	1	..	1	..	..	2	2	4	1	3	1	..	1	1	..	..
Asthma	..	..	..	10	14	..	3	..	1	3	..	2	..	..	1	1	..	..	1	4	..	2	3	1	..	..	..	1	1	1	..	..
Burns and scalds	3	1	2	62	13	6	11	6	4	5	6	2	5	1	3	3	1	2	2	..	5	1	1	2	2	4	2	..	1	7	1	2
Cancer	9	3	1	34	25	11	6	4	1	..	2	..	3	1	3	3	5	4	4	5	3	3	3	2	3	1	1	1	1	10	..	..
" of the breast	..	1	..	10	2	..	..	1	1	..	..	1	..	1	..	1	..	..	1	..	1	..	..	2	..	1	1	1	..	..	..	..
" " chest	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" " heart	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" " neck	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
" " ovaries	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" " stomach & bowels	7	3	2	27	32	6	..	..	2	3	1	1	8	3	1	1	..	4	1	4	6	3	8	5	..	..	1	5	8	..	..	..
" " uterus	2	2	1	15	13	2	2	4	1	..	..	..	1	8	1	..	..	..	1	1	1	1	1	3	1	2	..	..	..	12	..	..
Casualties	..	2	14	67	55	13	14	11	2	12	1	7	8	7	3	3	4	..	3	5	9	5	2	1	3	4	6	3	4	6	2	2
Croup	2	4	9	249	4	5	19	18	10	9	2	7	10	6	4	6	13	6	10	9	8	13	10	19	14	17	13	9	4	9	9	5
Congestion	..	..	..	3	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..
" of the brain	7	10	10	259	62	13	31	25	15	21	6	10	8	11	4	6	6	10	9	8	17	8	19	10	41	10	6	5	8	13	5	3
" " bowels	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
" " heart	..	..	..	2	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
" " liver	1	1	..	2	6	2	..	1	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	..	3	1	..	..	..	1	..	..
" " lungs	..	6	6	121	23	3	13	5	2	6	6	7	7	8	3	4	3	6	1	4	7	7	8	6	8	11	1	6	3	5	3	1
Convulsions	7	36	6	673	18	12	40	48	25	47	21	25	30	13	12	19	21	24	19	25	41	29	38	24	78	37	9	10	20	26	3	13
" puerperal	2	..	1	22	21	3	3	2	2	1	..	1	4	1	2	3	..	1	..	1	2	3	2	..	6	3	3	..	1	4	..	..
Consumption of bowels	..	1	1	15	6	2	1	2	1	1	..	..	2	..	1	2	1	..	1	2	..	1	2	..	2	2	1	..	1	1	..	..
" lungs	124	149	47	1127	630	192	125	108	55	92	77	41	118	66	45	95	41	46	46	76	117	54	72	69	125	101	27	38	33	198	14	23
Carbuncle	..	..	..	4	1	..	1	..	..	..	..	..	1	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..
Compression of the brain	..	2	1	6	4	1	1	..	1	..	..	..	3	2	..	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..
Cyanosis	..	2	1	40	..	..	4	3	1	5	2	..	1	3	1	2	..	1	2	2	1	1	1	3	1	..	2	3	..	1	..	1
Cirrhosis	2	..	..	9	4	2	..	..	..	..	..	1	..	1	..	1	..	1	2	..	1	2	1	1	1	1	..	..	2	..	..	..

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TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

DISEASES.	ALMSHOUSE.	PEOPLE OF COLOUR.	COUNTRY.	NATIVITY.			WARDS.																						UNKNOWN WARDS.
				United States.	Foreign.	Unknown.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Concussion of the brain	1	1	1	5	6	2	..	1	1	1	..	1	..	..	1	1	2	2	..	1	..	..	..	..	..	..	..	..	..	1	..	..
Cholera asphyxia	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" infantum	2	20	10	623	5	1	64	37	26	23	11	13	41	16	9	17	20	19	14	18	30	25	32	18	54	43	13	13	16	28	12	8
" morbus	..	3	3	33	21	4	4	7	2	3	2	..	5	2	1	3	2	1	1	2	2	2	3	3	5	1	1	1	2	1	1	..
Cramps	..	..	..	16	1	..	..	..	..	..	..	2	..	..	..	2	1	3	1	..	..	..	3	3	2	..	..	..	..	..	..	..
Caries of spine	..	..	..	4	1	1	1	..	1	1	..	..	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" bones of the face	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..
Chicken-pox	..	..	..	2	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Contusion of chest	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Colic	..	..	..	4	..	2	..	..	..	..	..	..	..	1	..	1	..	..	..	1	..	..	..	..	1	..	..	..	2	..	..	..
Coxalgia	2	..	..	3	2	2	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	2	..	..
Constipation	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..
Coryza	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Coup de soleil	..	..	3	4	17	3	3	..	2	..	2	2	1	2	..	..	2	..	..	1	..	..	1	..	3	1	1	..	..	..	..	..
Diphtheria	..	6	16	299	13	13	11	16	7	12	13	9	15	11	12	12	6	14	10	19	22	5	9	12	26	15	..	13	20	12	5	3
Dropsy	5	21	5	154	73	9	12	14	5	11	7	6	11	7	5	11	13	5	9	14	8	11	14	11	7	13	7	3	6	18	1	2
" abdominal	..	..	..	10	16	..	7	1	1	1	1	1	1	..	..	1	1	..	..	1	1	..	1	2	2	..	..	..	1	3	..	..
" of the brain	3	9	3	194	3	3	11	11	2	5	4	3	5	5	..	10	4	7	10	7	17	5	10	11	16	17	6	5	9	13	2	2
" " chest	..	2	1	42	12	1	1	4	2	2	2	..	..	1	1	2	2	..	3	4	5	2	4	6	5	2	1	1	3	1	..	..
" " heart	2	4	5	31	11	3	3	1	4	2	2	2	1	1	1	3	1	..	1	1	3	1	..	2	3	1	1	1	1	3	1	..
" " ovaries	..	..	..	4	..	..	1	..	..	..	..	..	1	1	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
" " stomach	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..
Disease of the brain	1	3	4	80	15	3	3	3	1	3	4	3	1	5	3	3	4	3	3	5	22	2	2	1	2	10	3	1	1	6	1	..
" " bladder	1	..	..	2	4	1	1	..	..	1	..	..	..	..	..	1	..	1	..	1	1	..	..	..	..	..	..	..	..	1	..	..
" " chest	..	..	2	3	2	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..
" " heart	4	13	18	151	72	19	10	11	8	10	10	6	10	8	3	14	7	4	14	13	19	7	7	4	14	11	6	9	7	11	..	1
" " kidneys	3	3	1	13	14	4	2	..	..	3	1	..	1	3	1	1	..	..	..	2	2	..	..	1	4	2	1	..	..	6	..	..
" " lungs	1	2	1	13	6	1	..	..	1	2	1	..	..	2	2	..	2	..	..	..	4	..	1	1	..	..	1	..	..	2	..	..
" " liver	..	..	2	14	28	1	4	1	..	1	1	2	..	1	2	1	3	2	..	..	3	2	5	1	3	6	2	..	1	..	..	..
" " spine	..	1	2	20	2	..	..	..	..	2	1	..	3	1	..	2	..	1	1	..	1	..	..	1	2	2	1	1	..	1	..	..
" " glands	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" " sto'ch & bowels	..	..	..	7	8	..	..	..	..	..	..	..	1	..	1	1	1	2	..	..	3	..	2	1	..	..	..	..	1	2	..	..
" " skin	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
" " throat	..	..	..	9	..	..	..	..	..	..	..	..	1	..	..	..	1	..	1	1	..	..	..	..	..	1	2	1	..	1	..	..
" " uterus	..	..	1	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..
Diarrhœa	39	12	14	243	65	109	15	24	9	14	9	5	17	5	6	15	8	6	4	2	11	22	14	23	39	15	9	2	10	12	6	1
Debility	37	74	14	617	242	81	74	45	35	80	48	21	49	25	19	26	27	21	16	25	41	32	45	51	65	34	18	23	10	11	64	10	11

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

DISEASES.	ALMSHOUSE.	PEOPLE OF COLOUR.	COUNTRY.	NATIVITY.			WARDS.																									UNKNOWN.	WHOLE NUMBER.
				United States.	Foreign.	Unknown.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
Dysentery	1	5	6	103	38	2	17	12	2	7	2	3	22	3	2	4	2	5	2	3	7	4	7	7	10	6	3	6	4	14	..	3	3
Drowned	..	6	12	71	36	28	9	6	12	5	12	4	9	..	2	5	7	1	1	4	2	5	6	5	6	3	3	..	3	5	5	3	3
Diabetes	..	1	..	9	1	..	3	..	..	..	..	2	..	1	..	2	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..
Dyspepsia	..	..	..	1	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Dislocation of spine	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
Dysuria	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Effusion of the brain	2	3	5	59	3	7	7	4	4	10	2	..	6	1	4	3	4	2	3	2	2	1	1	1	1	1	..	1	..	3	..	1	1
" " lungs	..	1	..	6	..	..	..	..	..	1	..	..	1	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	1	..	1	..	..	..
Epilepsy	3	1	2	17	7	4	1	1	..	1	1	2	2	3	..	..	..	2	..	1	..	1	..	1	3	1	..	1	..	6	1	..	..
Erysipelas	8	3	3	57	9	8	5	5	1	1	2	1	4	4	1	3	2	2	2	2	4	5	1	3	4	5	..	1	..	12	..	1	1
Emphysema of lungs	..	..	..	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Enlargement of heart	..	..	..	3	2	..	1	..	..	..	1	..	..	..	..	1	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..
" liver	..	..	..	3	2	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	..
" prostate gland	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	..	..
Exposure	1	..	..	3	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
Empyemia	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ecthyma	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fever	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
" bilious	1	1	..	12	8	3	1	1	..	..	..	1	1	..	..	1	2	..	2	..	1	1	2	1	1	1	2	1	1	3	..	1	1
" brain	..	..	4	17	..	1	..	..	..	..	1	..	..	..	1	..	..	1	..	..	3	..	..	4	..	1	..	..	1	1	..	1	1	..
" congestive	..	..	1	3	3	2	..	1	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	2	1	..	..	..	1	..	..	..	..
" camp	..	..	..	4	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
" catarrh	..	..	..	2	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" eruptive	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" gastric	..	..	..	5	2	..	..	..	..	1	..	..	..	..	..	1	1	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	1	..
" hectic	..	..	..	3	1	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..
" intermittent	1	..	1	1	4	2	1	1	..	..	..	1	..	..	..	..	1	..	..	..	1	..	1	..	2	1	..	..	..	..	..	..	..	..
" puerperal	..	..	..	7	16	..	1	16	2	..	..	..	..	2	2	..	..	..	1	2	..	1	2	..	2	..	..	1	..	1	..	..	..	..
" rheumatic	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..
" malignant	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
" remittent	..	1	3	18	3	3	1	1	..	..	..	1	1	1	1	..	..	..	..	..	2	..	4	2	1	2	1	1	..	1	..	2	2	..
" scarlet	7	7	17	440	3	18	30	30	22	19	14	9	36	19	10	13	7	9	15	23	44	12	17	19	22	20	6	4	2	38	2	2	2
" typhoid	3	16	68	392	127	135	34	34	11	17	14	12	45	10	7	48	11	41	18	13	25	25	17	20	51	41	17	8	16	41	8	2	1
" typhus	..	1	1	22	15	..	..	4	3	..	2	..	1	1	1	1	..	1	..	..	3	..	..	1	3	2	8	4	..	..	1	..	..	..
" yellow	..	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fracture of the arm	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
" " leg	..	1	..	1	7	..	1	..	..	..	..	..	3	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

DISEASES.	ALMSHOUSE.	PEOPLE OF COLOUR.	COUNTRY.	NATIVITY.			WARDS.																							UNKNOWN WARDS.
				United States.	Foreign.	Unknown	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Fracture of skull	..	..	1	4	5	2	..	..	..	1	1	1	1	..	..	2	..	..	..	..	..	1	..	..	3	..	..	..	..	..	..	..
" shoulder	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" thigh	..	..	..	3	1	2	..	..	..	..	1	..	1	1	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..
" pelvis	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fistula	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
Fatty degeneration of heart	..	..	..	2	1	..	..	..	..	..	..	..	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" " kidneys	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
" " liver	1	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Gangrene	5	4	1	36	10	9	3	1	1	2	4	2	1	4	..	6	..	1	4	1	2	2	1	..	3	3	1	4	1	6	1	..
Gout	1	..	..	3	..	2	..	..	..	..	..	..	..	1	..	1	1	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..
Gravel	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..
Hernia	..	..	1	8	6	..	..	2	2	1	..	1	3	..	..	..	..	..	1	1	..	..	..	..	..	1	..	..	1	..	..	..
Hydrophobia	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	1	..	1	..	..	..
Hooping-cough	..	19	7	204	1	3	4	12	7	10	12	7	16	10	3	8	3	2	7	11	10	2	15	7	15	18	5	7	3	6	1	..
Hemorrhage	1	1	2	50	27	5	9	4	2	3	1	..	5	3	2	4	2	1	4	2	11	3	10	1	5	2	1	1	1	3	..	..
" of lungs	..	1	1	16	5	..	3	..	1	..	1	..	2	..	2	..	..	..	1	3	3	..	1	1	1	1	..	..	..	..	..	..
" kidneys	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
" stomach & bowels	..	..	1	6	2	..	..	1	..	2	..	..	..	1	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	1	..	..
" uterus	..	..	1	7	6	..	1	..	1	1	1	..	..	..	..	..	..	1	1	..	..	..	1	1	..	3	1	..	..	..	..	..
Inflammation	1	..	..	4	1	1	..	1	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	1	..	..	..	1	1	..	..
" brain	9	15	7	334	16	15	31	26	17	20	11	8	19	14	11	8	13	9	6	7	26	16	20	12	21	12	4	11	9	20	2	5
" bronchi	3	12	1	89	21	6	8	4	3	5	5	6	9	9	6	2	4	3	3	6	6	5	7	2	3	5	4	4	1	5	..	..
" breast	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
" bladder	1	2	1	5	9	1	..	1	1	2	1	..	2	..	..	1	1	1	..	..	..	..	1	..	..	..	..	..	..	3	..	..
" chest	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
" ear	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" heart	1	..	..	17	9	2	1	1	3	2	..	..	1	1	1	..	1	3	1	..	3	1	2	..	1	2	..	1	..	2	..	1
" kidneys	1	..	..	1	3	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	3	..	..
" lungs	26	49	19	538	113	48	62	44	27	30	36	16	49	30	19	36	10	15	13	12	36	28	25	38	49	28	21	21	14	62	7	2
" liver	1	1	1	19	17	2	3	2	1	..	..	1	3	3	1	1	2	..	..	3	1	3	..	2	3	1	1	1	2	2	..	1
" larynx	3	..	..	16	3	3	..	2	..	1	..	1	..	2	..	..	1	1	4	1	2	..	..	..	..	2	..	..	1	4	..	..
" peritoneum	6	4	..	40	36	11	11	1	4	4	4	2	5	3	5	10	1	1	5	2	5	1	3	3	4	5	..	1	..	7	..	..
" prostate gland	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
" pleura	3	1	..	13	5	2	1	2	..	..	..	..	3	..	..	4	1	..	..	1	1	..	1	..	1	1	1	..	..	3	..	..
" parotid glands	..	1	..	4	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	..	1	..	..
" pharynx	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" stomach & bowels	7	14	11	219	60	18	24	10	9	17	13	6	22	6	6	10	6	6	7	7	12	13	17	18	23	18	8	5	7	19	1	3

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.
Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

DISEASES.	Almshouse.	People of colour.	Country.	Nativity.			Wards.																									Unknown Wards.
				United States.	Foreign.	Unknown.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Inflammation of spine	..	..	..	6	1	..	1	..	1	1	..	..	..	1	..	1	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..
" spleen	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" throat	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" tonsils	..	1	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	..	..	..	..
" uterus	..	..	..	2	5	..	..	..	1	..	..	..	1	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" veins	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inanition	10	5	5	93	10	22	10	11	4	5	1	1	4	4	1	12	2	1	5	8	2	3	4	..	13	3	..	3	1	21	1	..
Insanity	..	..	1	6	1	1	..	..	..	1	..	..	1	2	..	..	..	..	1	..	..	..	1	..	1	..	..	..	..	1	..	..
Jaundice	..	..	..	18	8	1	4	..	1	1	..	..	2	..	1	1	..	1	1	1	1	1	1	2	2	1	1	2	1	2	..	..
Intemperance and exposure	1	10	1	4	11	67	4	1	13	17	8	4	1	1	1	2	1	..	..	1	1	1	4	..	3	1	..	..	1	9	1	6
Icterus	..	..	..	5	1	..	1	..	..	..	1	..	1	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	1	..
Leucocythemia	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Marasmus	34	29	4	502	28	23	41	31	17	30	21	12	37	20	21	9	11	15	11	11	32	32	51	49	62	27	15	15	14	52	2	1
Measles	1	2	2	104	1	4	8	7	6	7	2	4	6	4	2	2	8	2	3	2	7	5	3	1	9	4	..	1	9	5	..	..
Mania à potu	6	..	1	19	27	11	8	1	1	..	4	1	5	2	..	1	2	2	1	5	3	2	2	1	2	3	..	..	..	8	..	2
Malformation	..	1	1	20	..	..	1	..	..	3	2	1	..	..	..	1	..	..	1	1	..	..	..	1	2	1	..	..	2	2	..	1
Metastasis	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
Melanosis	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Neuralgia	..	1	..	9	..	1	2	1	..	..	..	..	..	1	1	..	..	..	1	1	..	..	..	..	1	..	..	..	2	..	..	..
Neglect	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..
Neurosis	..	..	..	4	1	..	..	..	1	..	..	..	1	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Necrosis	..	..	..	2	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Old age	5	9	6	112	99	8	12	13	6	6	11	5	6	8	8	21	4	6	8	13	11	7	6	12	10	18	2	1	4	14	1	..
Obstruction of the bowels	1	..	..	19	5	..	1	1	..	..	..	..	1	3	3	1	1	1	1	1	2	1	1	..	2	..	..	1	..	1	1	1
Overdose of ether	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Ossification of the heart	1	..	..	3	4	1	..	2	..	..	..	1	..	..	..	..	..	..	..	..	1	..	1	1	..	..	..	..	2	..	..	..
" " aorta	..	..	..	3	..	1	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..
Œdema of the glottis	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Palsy	5	3	8	106	45	13	11	9	5	6	9	4	7	3	9	7	7	3	7	7	9	6	2	4	5	8	2	7	3	11	4	1
Pyæmia	5	..	..	11	7	11	1	1	1	1	..	..	3	..	1	2	..	1	..	1	..	1	..	1	1	1	..	1	1	11	..	..
Purpura	..	..	..	4	2	..	..	..	..	1	..	..	1	..	..	1	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..
Poisoning	..	..	..	5	1	..	1	..	..	..	..	..	1	..	1	1	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..
Rupia	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rheumatism	..	..	1	8	10	2	..	1	1	..	..	..	2	..	..	2	1	2	..	1	2	..	2	1	1	1	1	..	1	..	..	..
Rupture	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
" of the uterus	..	..	..	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	1
" " aorta	1	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Concluded.

Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

DISEASES.	ALMSHOUSE.	PEOPLE OF COLOUR.	COUNTRY.	NATIVITY.			WARDS.																							UNKNOWN WARDS.
				United States.	Foreign.	Unknown	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Scrofula	12	5	1	57	6	11	4	7	2	4	3	1	3	3	..	2	..	2	1	1	2	1	2	4	4	7	1	1	3	15	..	..
Smallpox	..	4	1	236	17	11	39	25	12	11	6	2	9	4	6	3	12	5	3	5	10	12	13	6	24	13	15	12	1	7	4	4
Softening of the brain	2	..	2	29	7	7	3	3	1	5	3	..	4	1	2	4	..	..	1	1	1	1	1	..	2	1	..	1	3	3	..	..
" " heart	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stillborn	..	54	4	709	..	2	56	40	25	44	31	28	31	17	17	21	19	25	16	22	51	26	47	30	52	34	11	7	12	24	5	16
Syphilis	13	2	..	14	..	7	1	..	..	1	2	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	14	..	..
Suicide	..	..	..	6	6	2	1	1	..	..	1	..	..	..	..	..	3	1	1	1	..	..	..	..	..	2	..	..	..	3	..	..
Suffocation	..	2	..	9	3	1	1	..	..	1	1	..	2	..	..	..	1	1	..	..	2	..	..	..	..	2	..	1	..	1	..	..
Stricture of œsophagus	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
" pyloris	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" glottis	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Strangulation	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..
Suffocating catarrh	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Syncope	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Scurvy	..	..	..	2	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..
Tumours	1	2	2	11	8	2	1	1	..	..	..	..	..	2	..	1	2	..	1	..	4	..	1	1	2	..	..	..	..	2	1	..
Tympanitis	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..
Tetanus	1	2	1	21	4	2	3	2	1	2	..	..	3	1	..	1	..	1	1	1	..	..	2	..	3	2	2	..	..	1	..	..
Teething	..	1	1	41	..	..	2	4	..	2	..	1	4	2	..	..	2	1	2	..	2	2	3	3	8	2	1	..	..	..	..	..
Unknown	15	3	20	41	14	42	5	..	..	1	2	3	2	2	2	1	1	..	2	1	3	6	2	3	4	..	..	..	..	31	..	1
Ulceration	4	1	..	2	..	4	..	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..
" of the bowels	4	..	1	8	7	6	..	..	1	1	..	..	..	..	..	..	..	1	..	..	3	..	..	2	3	..	1	..	1	7	..	..
" " bladder	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" " larynx	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
" " stomach	2	..	..	3	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..
" " throat	..	..	..	3	1	..	..	..	..	..	1	..	..	..	..	1	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..
Violence	..	..	..	2	4	1	1	1	..	1	..	..	..	..	..	..	..	..	1	..	1	..	..	..	1	..	..	..	..	..	1	..
Wounds	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	..	..	..	..	..
" gunshot	..	..	54	162	60	70	12	7	0	3	5	8	15	3	8	21	4	36	8	12	14	17	6	4	6	19	6	1	3	6	2	3
Worms	..	1	..	3	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Total	508	721	522	11059	2762	1276	1037	827	491	711	520	350	829	468	338	599	384	429	380	493	819	520	677	596	1042	736	284	286	329	1168	130	135

Total number of deaths reported for 1862			15,097
White	14,376		
Coloured	721		
Total			15,097
Males	8,315		
Females	6,782		
Total			15,097
From which deduct stillborn			711
			14,386

The number of male adults			4,049
" " female adults			3,010
" " male children			4,266
" " female children			3,772
			15,097
Deduct stillborn males		414	
" " females		297	
			711
			14,386

In Twenty-fourth Ward deduct deaths in Philadelphia Almshouse, 508.
Net deaths in Twenty-fourth Ward, 660.

April 1. *Spotted Fever, occurring in the vicinity of Philadelphia in the year* 1863. *Symptoms, Pathology, and Diagnosis.* Dr. W. W. GERHARD read the following account of this fever:—

About the middle of last February I was called to a case of a new form of disease; the patient, a boy of sixteen years of age, was taken suddenly with intense pain in head and back, with occasional delirium; there was also vomiting and nausea. In the intervals of the delirium he was dull and heavy, but able to answer questions correctly.

On the second day there was an eruption over the whole body of spots varying in size from such as would be caused by the prick of a pin, to an inch or more in breadth. These spots were of a dull red colour, not in the slightest degree elevated, and rather resembling ecchymoses, such as might be caused by the puncture of an insect than a proper eruption. There was no diarrhœa; moderate heat and fever; the tongue was scarcely coated. This patient died in four days from the attack, sinking into a state of coma. A sister of this patient, aged twenty, was taken ill and died in twenty-six hours from the commencement. She was attended by Dr. Packard, and had an eruption similar in all respects to that of the other patient during life. On examination after death no distinctive lesion was found.

A few days after these occurrences I was called to the Falls of Schuylkill, five miles out of the city, to see a number of cases of a new form of disease, which had excited much alarm in the neighbourhood; these were under the care of Drs. Service, Uhler, and Wilson. It was in that locality exceedingly fatal; in one family there were three deaths, and one other bad case of the disease, besides several others who were suffering from the causes of it in a mild form.

In another family there were also three fatal attacks; in a third there were two cases, one of which was fatal. The other cases which occurred, to the number of about twenty, were scattered singly in different families and in various localities. The isolated cases were less fatal than those which occurred in groups. Of the whole number of twenty, ten terminated fatally.

Unfortunately, no examination after death was permitted in any of these cases, notwithstanding the most urgent entreaties.

From an examination of the symptoms of a number of these cases, and comparing them with the one I had already seen in Philadelphia, I was enabled to make out the characters of this affection, which, never having been met with before in Philadelphia, was entirely novel to all of our physicians. The disease is unknown in Europe, and is not even mentioned in the complete work of Dr. Wood, or in any other one, I believe, on the Practice of Medicine. The only account of it to be found is an imperfect description given of it by a number of physicians in New England, where the disease appeared more than half a century ago, from the year 1807 to 1815 or 1816. These are contained in the works of Dr. Gallup, of Vermont, published in the year 1815, who speaks of it as having occurred for the first time in Massachusetts in 1806. Dr. E. Hale, of Boston, has also given an account of this disease, but there is a legitimate ground for doubt whether the disease he describes is not in fact genuine typhus fever, and totally different from true spotted fever. This work was published at Boston, in 1818, and there are scattered papers on the subject to be found in the *New England Journal* in the year 1814 and '15. Dr. Gallup gave the name of spotted fever to it. This designation should be retained, inasmuch as it is drawn from one of the most characteristic symptoms of a disorder which offers no peculiar anatomical lesions.

It seems also that epidemics of the same disease have appeared in Europe within different periods; such, at least, is the opinion of Dr. Gallup, although the history of the disease left to us is exceedingly imperfect.

There is no doubt that spotted fever has existed for some time in localities occupied by the U. S. troops. After the epidemic had occurred in the neighbourhood of Philadelphia I inquired of several of the army surgeons if they had seen any cases of the kind. They informed me that a number of examples of this unknown disorder had occurred near Norfolk, Virginia; and I have also heard that it has shown itself at Washington and Annapolis. Two cases, evidently of the spotted fever, are reported by Dr. Crary, of Hartford, in May, 1862, to the Connecticut Medical Society. The author speaks of them as examples of an anomalous and fatal variety of disease. (*Amer. Journal*, Jan. 1863.) I am also inclined to believe that the epidemic which occurred a short time since at Newport among the pupils of the Naval School was spotted fever, but I have yet seen no detailed account of it.

A limited but very fatal epidemic of this disease occurred during the month of March in Centre County, and another has also shown itself in York County, in this State. In the vicinity of Philadelphia the towns most affected by it were Manayunk, the Falls of Schuylkill, Norristown, Frankford, and Chester. It was not confined to the villages themselves, but has also shown itself in isolated dwellings. In the city of Philadelphia itself there were a number of cases, but scattered over a wide extent. From all the data I can collect, I should set down the number of cases in the months of March and April as at least two hundred. These occurred principally in the neighbouring towns, with but very few in the city proper.

Mode of attack and symptoms.—Some patients are taken down suddenly without the slightest premonition, with a chill and intense headache; others, again, have the usual premonitory symptoms of acute diseases for a few hours; a chill will then supervene, followed by fever; the countenance is slightly flushed, and the patient becomes dull and heavy—so much so that after a few hours, in bad cases, it is impossible to obtain any pertinent answer from a patient. In other cases he is dull and stupid, but answers when loudly spoken to. In slight cases there is merely a little dulness, but no positive stupor. There is occasionally positive delirium, but as a general rule the disturbance of the mind inclines more towards stupor or coma than active delirium. In fatal cases the patient always dies in a state of coma, which lasts several hours before death.

Another symptom of the disease is intense pain in the head and back, extending often to the limbs. This occurs with a chill, but very soon subsides, or at least is not spoken of by the patient, except when questions are directed to the subject. There is often vomiting at the commencement, but not usually very frequent or often repeated, and no epigastric tenderness. The bowels are rather constipated; there is a disgust for food in proportion to the severity of the fever. The urine is perfectly healthy.

The degree of fever is various; the pulse is frequent, not very strong, and in bad cases its force and frequency often diminish; the respiratory organs are perfectly healthy. The heat of the skin is more moderate than in most attacks of acute disease. In some cases I have remarked a peculiar odour exhaling from the patient. This, however, is not so marked as in many other varieties of disease.

Eruption.—In every case of the disease which I have seen, with the exception of one or two, terminating after an attack of a few hours, there occurred a characteristic eruption. This consisted of small spots, varying

in size from the point of a pin to the breadth of a quarter of an inch. In some patients there were much larger spots, or ecchymoses an inch or two in breadth; these seemed to depend upon the same causes which produced the smaller ones, and to be in fact identical with them, so that they might be termed confluent. The eruption, which at first glance resembled a genuine exanthema, was, on careful inspection, found to be very different from it. Each spot was of a dull red colour, almost purple in some cases, varying in shade, and, for the most part, not at all affected by pressure; some of the lighter coloured spots were to a certain degree diminished when strongly compressed, but the darker ones were evidently due to an effusion of blood in the midst of the true skin, and were therefore not modified in any way by external pressure. The spots were not in the slightest degree elevated above the surface, and were scattered pretty equally throughout the body, perhaps a little more abundant in the extremities than the trunk. The spots appeared usually at the end of twenty-four hours, but sometimes even sooner, and in some cases were visible after death, although not very perceptible during life. This was the case in those instances which terminated soon after the commencement of the attack. It may be readily believed from these remarks that the eruption was a simple exudation of blood or ecchymosis taking place beneath the skin, and similar in many respects to the spots which were sometimes visible in the interior of the body. In the cases of many patients the duration of the spots was very various—they were visible at least for a week or two, disappearing very slowly, in the same way as the dark colour of a bruise.

The complexion in many cases was peculiar, of a dull slightly sallow hue, but no trace of regular jaundice was perceived, nor did the countenance present the intensely red colour so often observed in typhus and typhoid fever. The eye was moderately injected in some cases, but rather in the veins than the arteries, and of a dull red hue. The injection, however, did not seem to be invariably present. No trace existed of any glandular swelling or inflammation, except in one case, in which an eye rapidly passed into suppuration and was entirely destroyed.

Age and sex.—No age was exempted; the patients were from two years to eighty-two. The largest proportion of cases, however, were in the young, between the ages of fifteen and twenty-five. More females than males were attacked. Of the cases which I saw two-thirds at least were females. Still, I would not conclude that one sex is necessarily more disposed to it than the other.

Anatomical lesions.—In one case in Manayunk, a patient of Dr. Uhler, I was enabled to see the autopsy of the whole body. The brain was found to be congested with blood, the veins containing an unusual quantity of it. At the base of the brain was an effusion of a few ounces of serum; the ventricles of the brain contained a moderate quantity of serum, but there was not a trace of any lesion produced by inflammation.

The lungs were slightly congested at their posterior portion, but in other respects were healthy and crepitant. The right cavities of the heart contained a considerable quantity of black fluid blood, of a remarkably dark hue, with a very small and flaccid coagulum. The left ventricle was perfectly empty. On the portion of the pericardium covering the left ventricle were two spots of a deep red colour, one of a quarter of an inch in breadth, the other somewhat larger, dependent upon an effusion of blood beneath the membrane. Another spot, of a rather larger size, was found beneath the serous membrane of the stomach. All these sub-serous ecchy-

moses were precisely similar to that found in one of the glands of Peyer, and were evidently dependent upon similar blood effusions.

The stomach contained but little mucus, its internal coat firm and healthy, and moderately injected. The small intestines healthy throughout, except one of the glands of Peyer, in which there was an ecchymosis of blood a quarter of an inch in breadth; the large intestine was healthy. The liver was of its natural colour and healthy.

The uterus was healthy, with a small coagulum of blood attached to its orifice. Beneath the serous membrane of the stomach was a dark red spot, of a third of an inch in breadth, similar to those already mentioned, and evidently depending upon a local effusion of blood.

The anatomical lesions thus confirmed the conclusions at which I had already arrived, respecting the pathology of the disease. That is, it is strictly a blood disorder, unconnected with any structural lesion. The internal ecchymoses of blood are precisely similar to the spots on the skin, and are evidently depending on the same cause. This fact establishes a wide distinction between them and those appearing in typhus and typhoid fevers, as well as the eruptions of the exanthemata. Although the proof of spotted fever being a blood disease is to my mind conclusive, it must not be ascribed to an impoverished condition of this fluid from innutritious or deficient food, as none of the patients whom I saw was in a condition of actual poverty, and a large majority of them belonged to a class amply supplied with all the comforts of life.

Origin and extension of the disease.—It is very evident from all the facts which I have learned, that this disorder appeared in the Army in Virginia before it had reached Pennsylvania; and it has evidently shown itself in other places, as in Connecticut. In this State it has struck particular localities, not, however, rigidly confined to them, but extending to detached habitations, and attacking persons who had not been in the neighbourhood of any sick. In the city of Philadelphia it has not extended beyond the families of those first attacked; nor, with the exception of a single instance, have I known more than one person in a family affected by it. At the Falls of the Schuylkill it presented some tendency to prevail in families. In one there were, including all cases, both grave and slight, at least seven or eight affected. Still the disease did not necessarily extend itself to the neighbours, who were constantly engaged watching the sick, nor was the reception of one patient into a house at all a cause of attack of disease to others. At Manayunk it broke out amongst the workwomen employed in one room in a woollen-mill, which furnished a number of patients, giving rise to the idea among the people of Manayunk that the disease was propagated from some contagious matter contained in the wool. It is needless to say this opinion was totally unfounded; indeed, from the whole history of the disease, there is no reason to conclude that it is in any way contagious, or, if at all capable of transmission one to another, it must be only in peculiar cases, like typhoid fever or dysentery, which, although as a general rule not contagious, are in some cases capable of transmission to other patients. I am inclined to believe that there is no positive evidence of this disease being ever communicated from an infected patient to those who are healthy. It is the more important to understand this mode of propagation of the disease, as some individuals have been disposed to regard it as a contagious disorder originating from the army.

Duration.—No disease has, in the fatal cases, a much more rapid course. A case terminated fatally in seven or eight hours; a number have died in

from twelve to twenty-four hours. The largest number in the course of the second day. If the patient should live after forty-eight or fifty hours there is a fair chance of recovery, although fatal cases are met with after lasting for several days. In one case, even, death followed after the lapse of several weeks. The duration of cases ending in recovery is equally variable with those that are mortal. Some are convalescent after two or three days of indisposition, others last for a week or two, and in one case at the Falls of Schuylkill, a patient of Dr. Service, recovery was protracted for many weeks.

Diagnosis.—It must be very plain that on the first appearance of an unknown disease in our midst, all ordinary rules of diagnosis fail. The first case which I saw, was so utterly perplexing, that I could not in my mind arrive at any satisfactory diagnosis of the case, therefore as the symptoms of the brain were more developed than those of any other organ, I reported the case as death from meningitis. A physician who attended another case in the same family was equally puzzled with myself, and reported the disease as typhoid fever. There are two cases evidently of this disease reported by Dr. Crary in the *American Journal*, January, 1863, as examples of an unknown and fatal character. The diagnosis of the affection, when once thoroughly understood, is not, however, difficult, for the same set of symptoms occur in no other disease. These are the sudden occurrence of intense headache and spinal pain, followed by the peculiar eruption which resembles that of no other fever, but presents a distinct resemblance to the ecchymosis of scurvy, and besides this, the rapid development of brain symptoms, that is stupor, more or less severe, and in bad cases always coma. No one who has become once familiar with this disease can possibly mistake it for any other, such as typhoid or typhus fever, or the various forms of exanthema.

A number of my medical friends, of the highest professional standing in this city, have never yet seen examples of spotted fever. Under these circumstances some of them have been led into precisely the same error of diagnosis into which I had myself fallen with regard to my first case of this disease. Some have fancied it was a variety of typhoid fever; a larger number, of typhus fever; and one, oddly enough, of influenza. It requires nothing but actual observation to entirely dissipate all such ideas. The disease belongs to the same class as other continued fevers or exanthemata, but is just as distinct from typhoid or typhus fevers as from measles or smallpox. The two affections to which it has the closest similarity are the petechial typhus fever and some malignant varieties of scarlatina.

The peculiar colour and form of the eruption, and the development of throat symptoms in the latter affection, added to the other characters of the disease, will point out sufficiently the pathognomonic symptoms of scarlet fever. There remains, then, merely the diagnosis between spotted fever and certain varieties of typhus; for I take it as demonstrated that no one could possibly confound two diseases so perfectly distinct as spotted and typhoid fever.

Between typhus and spotted fever, however, there are some points of resemblance; both these diseases attack subjects of any age, are nearly equally free from pathological lesions, and are each attended by a peculiar eruption. Still there are well marked diagnostic characters which mark a broad distinction between these diseases. These are as follows: in spotted fever the disease is very rapid in its course, with delirium, but rarely of an active kind; an eruption wholly different from that of typhus; less heat of

skin, which is never of the burning temperature of typhus, and with none of the peculiar odour of this disease. Typhus offers a true exanthematic eruption; but I have already described that of spotted fever to be rather a scorbutic hemorrhage than a real exanthema. Besides, the duration of typhus fever is nearly as regular and as long as typhoid; whereas in spotted fever the course of the disease is irregular, and generally much shorter. The fearful difference in the mortality of the two disorders and the unequivocally contagious character of typhus fever, with the slight probability of the existence of any symptom of the same kind in spotted fever, are also additional points of diagnosis.

In the year 1836 I was first led to study the diagnostic characters of typhus and to lay down the distinctive characters separating it from typhoid fevers. (*Amer. Journal*, 1837.) These are now adopted by all the physicians of the French school, and by a large number of English observers. I could not, therefore, help regarding it a most fortunate circumstance that accident had afforded me an occasion for establishing the characters of another variety of febrile disorder which, although not so common as either typhus or typhoid fever, is yet more fatal in its symptoms and course. These three varieties of fever I regard as more distinct than many cases of intermittent and remittent; and although occasionally the distinctive characters may be somewhat confused one with another, yet on the whole they are so well defined that no legitimate excuse can exist for confounding them one with another. The diagnosis of the spotted fever is, however, much better defined than that of typhus and typhoid is in all cases, for sometimes these approach so nearly in their symptoms as to render the diagnosis of them very difficult. In spotted fever no one with but a moderate power of observation could possibly confound it with the other affections; although some medical gentlemen of high professional standing have supposed it to be identical with them. The only thing which makes their opinion valueless is that they have never seen a case of spotted fever.

This disease, indeed, is one which I should place in the list of rare peculiar disorders, evidently depending upon a diseased condition of the blood, which occasionally show themselves; they last for a time, then disappear, but are not sufficiently permanent in their attacks to find a place in the regular treatises on the practice of medicine. Such were the two epidemics of negro fever, as they were called, which appeared in Philadelphia, the last one about fifteen years ago. Of the second of these epidemics, I am sorry to say, no history was ever given. A short account of the first one which appeared in the years 1820–21, at Philadelphia, was given by Dr. Emerson in the 3d volume of the *Philadelphia Medical Journal*. It is very evident that although this was, like spotted fever, a blood disease, in symptoms and course it was very different. It was besides almost confined to the coloured inhabitants of the city. Of the last mentioned one, I saw a few cases at the Almshouse in this city; it did not, however, bear the slightest resemblance to the spotted fever, and besides, was confined mainly to the colored population. It is needless to say some history should be preserved of all such rare and anomalous forms of epidemic disease.

Besides, the diagnosis becomes easy to one who has become familiar with the disease, from the individual physiognomy of the patient. There is a peculiar dusky hue, and an expression of stupor conjoined with the eruption which characterize the disease at once, especially if we add to these signs the cerebral symptoms of the disease. The diagnosis of the

disorder has been especially interesting to me, as I believe that I was earliest in making out its distinctive characters; certainly so in this locality.

Prognosis.—The prognosis of the disease is soon learned. If the cerebro-spinal symptoms are but moderate, and the fever not very intense, the patient will certainly recover unless badly treated. The prognosis is always, however, a most serious one. At its first appearance as an epidemic it is exceedingly fatal. In different localities from one-half to two-thirds of those attacked have fallen victims; in one locality I have been told the mortality was even greater, nearly all attacked having died. When a proper system of treatment is adopted, a favourable prognosis may often be made. If, however, the poisonous cause of the disease acts with great energy, rendering the patient comatose within a few hours, the prognosis is very serious if not necessarily fatal.

Mortality.—The mortality in spotted fever like that in many other severe diseases, is of course at first very great, as in all epidemics of the kind. Physicians endowed with a moderate degree of self-complacency are apt to imagine that they have adopted a new and successful method of treating a disease, when, in reality, the sole difference is, that the disorder has lost the violent character which at first was peculiar to it; still, this epidemic of spotted fever has been thus far so severe that it is probable, though I cannot state the proportion with certainty, that at least one case out of three or four has been fatal. At first the mortality was much greater in several localities.

Nomenclature.—Inasmuch as this disease is attended by no definite anatomical lesions, the appellation given to it more than half a century ago by Dr. Gallup and others in New England of spotted fever, should be retained. It is sufficiently characteristic, and involves no doubtful point in question. The only objection to the term is that the disease may be confounded with epidemic typhus or ship fever, in which the whole body is also covered with spots, but these constitute a real exanthema, and are, of course, of a totally different character and aspect from the eruption of spotted fever. The latter is little else than a real hemorrhagic effusion very like that of scurvy.

Treatment.—In the present epidemic I have never practised nor advised bloodletting in any case I have seen; nor am I aware that others have resorted to it; the whole characters of the disease are such as would render this remedy, in the majority of cases, exceedingly dangerous. I should very much doubt, from the pathological history of the disease, whether general bleeding would ever be appropriate, as the disease is one evidently depending upon a morbid but not inflammatory condition of the blood. Cupping has been tried in a number of cases, but with doubtful results. In some cases, however, it is possible it may be a benefit. The principal treatment consists in applying external heat in the cold stage, and afterwards placing flying sinapisms to the extremities. A blister to the back of the neck may sometimes be applied; but of the favourable action of this remedy I must admit that there is often much doubt. Not that the immediate contra-stimulant action might not relieve the brain and produce a salutary revulsion upon the nerves immediately connected, but because the disease is so evidently a blood disorder, with a strong tendency to local effusion. Therefore, if we carelessly direct the application of blisters we may do mischief to a patient in whom extravasation of blood has either actually taken place, or is in imminence of showing itself. The head should be

sponged with cold water, and occasionally cold may be more permanently applied.

The most important remedies, however, are stimulants—whisky, brandy, and the like, and quinine given in doses of a grain every hour. Sometimes as much as two grains every hour may be administered for a short time. The quantity of brandy used is sometimes very large—at least a tablespoonful every two hours, or even every hour. In others a much less dose will be ample; that is, the same rule should be observed in the treatment of this disease as in many cases of typhus fever; stimulants should be given in such quantities as the peculiar symptoms of the individual case and the special condition of the patient may require. It is, of course, impossible to fix any precise quantity as the dose which is required; but a certain proportion of wine or some alcoholic stimulant has been necessary in every case which I have seen. Other stimulants are doubtless often of service, such as ammonia, ginger, &c., but as none of them is equal to some alcoholic preparation, they are of comparatively little value in so rapid a disease as spotted fever.

The necessity for stimulation is based upon the rapid loss of force which takes place in this disease. To so great a degree does this exist that I have not seen good effects from even local abstraction of blood which was prescribed in a few cases by physicians who had been in attendance on several of the patients. This view of the effect of bloodletting is confirmed also by the pathology of the disease. It is not an inflammatory disorder, but obviously depends on an altered condition of the blood, which cannot be cured by diminishing its quantity, but on the contrary the true treatment of the affection depends upon the curative efforts of the system, which is to be supported instead of enfeebled during the process.

Singularly enough, however, Dr. Gallup recommends the treatment of the disorder in New England by copious bloodletting. This treatment was unfortunately at his time carried to an extraordinary excess, and is evidently founded upon the absurd practice, then too much in vogue. Still, I would not be understood as absolutely condemning in all epidemics of this disease, the depletory treatment. It is possible that under certain circumstances it may be allowable, but in the cases which I have seen it would not be warranted by either the pathology or symptoms of the disorder.

If vomiting does not occur spontaneously, it is well to bring it about by a draught of warm water or a mild dose of ipecacuanha. The reason for this treatment is based upon the fact that the natural emesis should be regarded as a spontaneous mode of relief, or perhaps it may be caused by the necessity felt by the stomach to free itself of a quantity of matter which it cannot digest. This necessity is much more obvious in this disease than in most other affections, from the suddenness of the attack, which often strikes individuals in perfect health, without being preceded by the usual prodromes of disease.

Purgatives should not be trusted to; they would much annoy and enfeeble the patient without doing good. An enema may be given at the commencement and a light laxative soon afterwards; but this is merely for the purpose of unloading the bowels, not for having any special action on the disease. The food should, of course, be at first limited to diluent drinks; but if the disease last over a day or two I would give the patient essence of beef or some equally nutritious substance.

It is thus perfectly plain that the mode of treatment is based entirely upon a conviction that the important indications are to keep up the strength of the patient, and to combat, as far as possible, local symptoms until the

poison causing the disorder should be eliminated from the body. It is worse than useless to diminish the strength of the patient, for upon this we depend to carry him safely through the disease. This mode of treatment, I may state, has been generally followed by physicians who at first had been much less successful with the ordinary remedies used in the management of many acute disorders.

If I were disposed to mingle theoretical reasons with the absolute deductions of fact, I should regard the stimulant treatment as proved to be the most appropriate by the symptoms and the absence of decided structural lesions. The disease I believe to be produced by some unknown cause, which we may call poison if we choose, acting upon the body. A certain time is required for the elimination of it from the system, and during this process we must support the strength by appropriate food and stimulants.

Other remedies than those I have mentioned are appropriate to certain symptoms in spotted fever, but those, of course, will occur to every practitioner in every case he may be called upon to treat. I wished merely to indicate the mode of treatment on which we must rely, leaving details for the administration of every practitioner.

Spotted Fever.—Dr. LAMB, in response to an inquiry by the President, as to his experience in this epidemic, made the following remarks:—

In describing the anomalous disease which has recently given so much alarm in some of our suburban villages, it may be very proper to describe the general aspect or physiognomy of the patient, which is so remarkable, that when once seen, similar cases cannot be easily mistaken. It would be very difficult to describe the anxiety and intense suffering exhibited in the countenance of the patient. The jactitation is incessant, and the suffering without intermission. I will endeavour to describe some of the most striking cases as they were presented to my observation.

The first decided case I was called to, was in Frankford, on the 12th of March. The patient, J. McC., was a girl, in her eleventh year. She had been suffering since the forenoon of the preceding day. The mother had given her cathartic pills, which I suppose had operated freely; she had vomited frequently, and at the time of my visit was suffering from tenesmus, or imagined that she wished to pass something, desiring constantly to be on the close-stool, but without really having any evacuation. The child was constantly rising on her elbow, or turning from one side to the other, complaining of her forehead, back, and extremities. There was no sensible increase of heat; but a peculiar flush of the face, with a wild expression of feature, considerable dilatation of the pupils, which seemed insensible to the effect of a strong light. Tongue moist and slightly furred. Pulse irregularly intermittent, above ninety in the minute, distinct but not full, and easily compressible, no appreciable disturbance of the respiratory organs, no tenderness of the epigastrium or tension of the abdominal muscles, but extreme sensitiveness to the slightest touch or pressure upon the arms or legs. At 10 P. M. there had been no return of vomiting; in other respects no change was observable.

13th. The patient has spent a restless night, and the delirium which had been persistent from the beginning is unabated, though the attention could be gained, and she would seem to answer my questions with sense, and begged me to do something for her head. Pulse a little more frequent and more full. Some increase of heat about 2 P.M., when, for a few hours, there appeared on the arms and legs something resembling urticaria, vary-

ing from a few lines to an inch in length, slightly raised, as if produced by a blow from a switch, and uniformly pale red.

14*th*. The patient has spent another restless night. Pulse very irregular but yet distinct. The remarkable irregularity consisted in a frequency of about two and a half, and then suddenly falling off to one pulsation in the second, and this alternating from four to six times during one revolution of the second hand!

15*th*. The patient could be aroused, and responded slowly to my questions. Pulse still perceptible and irregular. Pupil of the right eye very much dilated, while the left pupil was contracted to a mere speck. At noon she was in a profound stupor, and ceased to breathe at 4 P. M.

In this case the alvine and urinary evacuations continued normal. There was no regular chill, but a slight daily exacerbation. During the last night and day the skin was pleasantly warm and moist. From the first there was no refreshing sleep; when the eyes were closed in apparent sleep for half an hour at a time, there was still no cessation of motion, nor was there any abatement of the delirium.

While this first case was under treatment, M. E. R., a girl of eight years, in a parallel street, distant about five hundred feet, was attacked. On the 13th she was at school, and out from home until 10 o'clock in the evening. The mother first ascertained that the child was ill about midnight. On the 14th her situation was very similar to that of the first patient. She became comatose about 2 P. M., and died at 5 P. M. on the 15th. A few specks, like flea-bites, might be seen on the neck and breast of this child.

After an interval of ten days, during which time no case occurred in or near Frankford, three cases came under my notice, all commencing about 8 P. M. on the 24th of March, two in the family of Mr. E. and the other in the family of Mr. R. The former, on the eastern side of Frankford, about six hundred yards east of the first two cases, and the latter about the same distance east of Frankford, in Bridesburg.

Miss M. E., aged nineteen years, had been uniformly healthy; she complained of acute pain in the forehead, with pain and excessive tenderness of the extremities. Some nausea, slightly delirious, pupils of both eyes dilated, skin moderately warm, face flushed, pulse about ninety, with frequent intermissions; circulation sluggish and deficient in power; a few small petechial specks on the legs and arms; tongue moist and slightly furred.

25*th*. Some improvement in the circulation; pulse eighty-four, full, but compressible. In the evening the pulsations were ninety-four with increase of delirium. Evacuations regular and normal.

26*th*. The patient has passed a very restless night, and the pulse exhibits the singular irregularity noticed in the case of J. McC. The general aspect of the case is more serious.

27*th*. A moderate catamenial flow commenced last night—ten days too soon. The patient is evidently sinking. But there is a remarkable steadiness of the pulse, almost approaching to a healthy standard. Pulse without intermission, and seventy-two in the minute, full; skin pleasantly warm and moist; breathing full and free. Had other conditions of the system been equally favourable, I should have felt that she had passed the crisis, and might recover. But she was then sinking into a state of insensibility, had nearly lost the power of deglutition, and died at 11½ P.M. Coma in her case did not become complete until about three hours previous to death.

The case of her brother, J. E., aged fourteen years, was in several respects different, and had a more satisfactory result. He had previously suffered from pulmonary disease, and the chief point of attack was now in the same organs. He had the intermittent pulse; the petechial spots and *congestion* of the lungs; same pain of the head, but no delirium. Within the first twenty-four hours he seemed in great danger of speedy suffocation, but the crisis soon passed, and after the fourth day he became convalescent. His recovery was perfect and rapid.

The third case occurring on that evening, Mrs. E. R., aged thirty-seven years, ran very speedily to a fatal termination. She took her tea as usual about 7 P. M. At eight she complained of acute pain in the head and giddiness. She was carried up to the bedroom in the arms of her husband. Body warm and extremities cold. Pulse irregular and intermittent, thread-like. Pupils greatly dilated, and vision very indistinct; delirious. Mrs. R. became comatose at 4 A. M., and died at noon, of the 25th, about fourteen hours from the first feeling of indisposition. In this case there were numerous patches or blotches on the body, face, and extremities; some having the appearance of ordinary ecchymosis, while others looked and felt as if the skin had been forcibly raised or pinched up, and blood effused so as to elevate the surface. These blotches varied in size, from three or four lines to three-fourths of an inch, with irregular points. It was ascertained that this patient had her catamenial flow out of time during the few hours of her illness.

In the family of Mr. E. where there were already two cases, a third, Miss A. E., was attacked on the evening of the 26th. I saw her within one hour from the first feeling of indisposition. The acute pain in the forehead and back were her first symptoms, and at this early stage of her sufferings the pupils of both eyes were dilated, the right eye much more than the left; the face was flushed, the body and extremities warm, pulse very slightly intermittent, not more than eighty-four to the minute; tongue moist and a little furred; extreme restlessness, and muttering delirium; some nausea, with occasional vomiting. At 8 A. M. on the 27th there was an increase of delirium, with a tendency to sink. The inferior extremities were covered with an efflorescent eruption, which might have been mistaken for rubeola or variola. From the knee down, the cuticle was perceptibly elevated, giving a feeling of decided roughness to the skin. Emesis was still troublesome; the matter thrown up seemed to be composed of dark bile mixed with mucus. She now complained of soreness and pain in the legs, with increased pain in the spinal column. The head was thrown back, forming with the cervical vertebræ a slight, but very decided curve.

28*th*. There seemed to be an improvement in the general aspect of this case. Pulse more full and regular, less delirium, but the tetanic appearance in the position of the head continued.

29*th*. No perceptible change. One of my medical friends from the city, who saw her to-day, thought she would recover. Her monthly flow has made its appearance out of time. On the 30th this patient was in the same condition, and so continues to the present time, giving strong hopes that she may be restored to health.

On the morning of the 27th the step-mother of these three children, Mrs. E. E., complained of slight pain in the head. Her age is twenty-nine years. She seemed exhausted from loss of rest and debility. Pulse intermittent. I advised rest and nourishment; but she maintained her

position by the bedside of her sinking daughter M. until the case terminated.

28*th*. I found Mrs. E. at 8 A. M. suffering from intense pain and soreness of the right thigh and leg, with a feeling of suffocation. The pain was in the course of the femoral vessels, just below the groin; the interval between that point and the knee was neither tender nor painful, but the knee and leg were so extremely sore that the slightest touch or pressure was agonizing. Pulse intermittent. Tongue covered with a light-coloured coat. Skin pleasantly warm. Evacuations normal, except that she was unwell at the middle of her period. The inferior extremities were covered with an eruption in all respects similar to that of the second daughter, and she continued to suffer until this, the fourth day, when I find her in all respects better. She has passed the crisis in safety, and will, in all human probability, recover.

In the few cases which have been under my care, I have seen no decided response to any remedial agent where the head was the chief point of attack.

Cystic Disease in an Undescended Testis.—Dr. HEWSON gave the following account of a case of this kind, operated on recently by him, and showed the diseased parts as removed, with a cast and photograph of them before the operation.

Although cases of disease of the testicle when retained in the inguinal canal have been reported by Chopart, Robert, and others, but little I find has been made known or written in regard to the history or diagnosis of such diseases. I have, therefore, thought it advisable to present to the College this evening, the specimen whilst fresh, removed by me from such a case at present in the Pennsylvania Hospital, with its history, as far as completed, and with a cast and photograph taken previous to the operation.

This patient is named Henry Faust, and was admitted on the 23d of March. He is a single man, 40 years old, a German by birth, a dyer by occupation, and has been living in Allentown, Pa., where he had enjoyed uninterrupted good health up to about three years ago, when he received a blow in the right inguinal region directly on the testicle, which was lodged in the canal there.

This occasioned a swelling, which soon became painless, but steadily increased until last December, when it had attained half the size the cast shows it to have been when he was admitted into the hospital. He then (last December) received another blow on it, which caused it soon to double its previous size. After this sudden increase in the tumour, the man's lower limbs began to swell from dropsical effusion. For this he was treated in Allentown, where it was also proposed to tap the tumour, under the impression that it was a hydrocele. He refused to submit to this operation, and came to the city.

On examining the tumour I found it irregularly ovoid, measuring around its base 19½ inches, across its surface in the line of its greatest diameter 11 inches, and across its surface, in that of the lesser or vertical diameter, 9 inches. It was firm but elastic to the touch, and the veins on its surface as well as those on the same side of the abdominal walls, were very much enlarged. The tumour was evidently beneath, at least the tendon of the external oblique, from the tension produced in the walls of the belly, from the crest of the ilium over to beyond the symphysis pubis. The upper part of the belly was perfectly soft and flaccid.

Coughing caused the tumour itself to move in a singular manner, by elevating the inner and depressing the outer end at the same moment.

No hernial succussion could be felt from this coughing.

The elasticity was considerable, especially at the apex of the tumour, but no fluctuation could be felt, nor could any light be transmitted through it in a darkened room.

At its base the tumour felt firmer and denser than at any other point, but did not appear to be firmly adherent to the bone or other tissue beneath.

There was neither œdema nor hydrocelic effusion in the scrotum, which, on the contrary, was quite empty, as the left testicle was also drawn up, partially, into its inguinal canal.

The only sensations the patient complained of were those of weariness and tension in the inguinal region. His countenance was somewhat sallow and anxious. His tongue was clean, and his pulse quite natural and tranquil. He presented the appearance of possessing his virile powers in their fullest extent. The age of the patient and his appearance naturally suggested, at first, the idea of this tumour being malignant, but its history and progress, and the sensations derived from its examination were against such a supposition, and the impression made on my mind, after a careful consideration of these circumstances, was that I had a case of cystic sarcocele to deal with, that the only means of relief was in complete excision.

This operation was undertaken with the concurrence of my colleagues, Drs. Norris and Pancoast, on last Saturday, the 28th of March, before the class at the hospital. I proceeded in it with as great caution as if I had a case of strangulated hernia to deal with, and, indeed, the existence of a hernia, in the midst of the morbid mass, had occurred to my mind as a possible complication. I made, first of all, an incision on the grooved director, along the surface in the direction of the greatest diameter of the tumour of at least 11 inches, through the integuments, and then through the tendon of the external oblique, so as to completely expose the whole mass. The tunica vaginalis was then reached. This was found very much distended and, on puncturing it, about a pint of clear yellow fluid, like that from a hydrocele, escaped. Then the testicle, with the epididymis and cord studded here and there with small cysts from the size of a pea to that of a filbert, was revealed, and all these structures were found much enlarged and diseased, the testicle and epididymis increased to at least three times their natural size.

These with the tunica vaginalis were carefully separated from the tissues beneath by the fingers and handle of the scalpel, exposing the peritoneum below the arch of the conjoined tendon for the distance of at least two inches. The cord was then found diseased so high up that I had to enlarge the external end of my original incision before I could get a ligature around it in a part where it was evidently healthy. This accomplished, the severing of the diseased mass from the remnant of the cord was effected by the ecraseur. The use of this instrument did not, however, prevent all hemorrhage, for I had subsequently to secure a vessel of considerable size in the stump left behind. The only other vessel which occasioned any amount of hemorrhage during the operation, was the epigastric, which was, of course, secured without much difficulty, as was also the superficial circumflex, and one or two small vessels in the bottom of the wound. The wound was then dressed with leaden sutures, and the patient put to bed and ordered ℥ss of solution of morphia, after he had recovered fully from the effects of

the ether. The whole operation occupied the greater part of an hour in its performance, and as but three days have elapsed, nothing can yet be said in regard to its result, but I shall take some future occasion to make it known. By the expiration of my term of service, for the present, at the hospital, the case has passed into the hands of one of my colleagues for after-treatment. The great extent to which the peritoneum was exposed in this operation necessarily endangers the patient's life from inflammation of that extensive and sensitive serous membrane.

As to so extensive a collection of fluid as that found in the tunica vaginalis in this case, escaping detection by transmitted light, after the careful examination given to it by my colleagues and myself, I have no explanation to give, unless it be that the tendon of the external oblique being stretched like a tent (of which the apex of the tumour represented the pole), prevented any position in which the light could pass through the fluid.

A minute examination of the portion of the cord removed in the operation, has shown it to be in a state of great hypertrophy, in the midst of which there is a streak of yellow, soft tissue, which, microscopically, has been found to be the same growth in a state of fatty degeneration, with here and there some tubercular matter.

In the lower part of the epididymis and in the testicle itself the fatty and tubercular deposits predominate, and are very extensive. There are the remains of some small cysts still to be seen in the substance of the testicle, as well as on the epididymis.

A fact of some interest to the anatomist was, in this case, the perfect character of the tunica vaginalis, enveloping as it did the gland and being completely closed around the cord above, so that no hernia could take place along the cord. A small band of apparently dense cellular tissue extended from the lower end of this tunic into the scrotum.

(*Addenda*, furnished by Dr. HEWSON to complete this history.)

This patient died on the 3d of April, a victim of erysipelas, which attacked simultaneously nearly all the patients who had been recently operated on in the hospital. His wound became œdematous, and gangrenous on the third day. His belly grew enormously tympanitic, and he sank in low muttering delirium on the sixth day. I had not the opportunity of witnessing the autopsy, but have been furnished with the following notes taken on the occasion by Dr. Richardson, the resident who had charge of the case.

Autopsy made April 4, 1863, 24 hours after death.

"*Lungs*. Contained a few scattered granular bodies which were not aggregated together, but may, perhaps, have been tubercular." (No microscopic examination appears to have been made of them.)

"*Heart*, healthy, but contained firm clots in all four cavities."

"*Liver* and *Spleen* normal."

"*Kidneys* appeared fatty, but no microscopic examination was made."

"*Intestines* seemed healthy, and *there was no peritonitis*."

"*Stomach* contained about ℥iv of black vomit, but its mucous surface presented no evidence of inflammation."

On the front of the spine and firmly attached to it from about the level of the 10th dorsal to that of the 4th lumbar vertebra, was a mass of substance, which was cut into while removing the mesentery, on the supposition of its being some enlarged gland. But, upon further examination, it was found to be about 1½ inches thick, and to have imbedded in it the abdominal aorta, still pervious; on tracing the vena cava ascendens downwards from the diaphragm to the right vein, it seemed to have become obliterated.

"Exploring the vena cava under the microscope, a portion of this has showed a great number of tubercle cells mixed with much fibrous tissue."

Cataract.—Dr. HAYS made some verbal remarks on this affection, of which the following is an abstract.

Dr. H. said he would offer for the consideration of the Fellows of the College some speculations which have lately been occupying his thoughts, and which, if well founded, would tend to invalidate a long accepted surgical precept, and also to elucidate the pathology of cataract.

There are few doctrines more firmly established, than that cataract is not amenable to medical treatment—that its progress can neither be arrested nor retarded by therapeutic measures—and that the only means of relief is a surgical operation. It certainly had been too often the speaker's painful task, when applied to by persons affected with incipient cataract and who anxiously inquired whether the progress of the disease could not be arrested, to be obliged to crush their hopes by the avowal that no such means existed, and that they would be obliged to abide their time and then trust to an operation for their relief.

It is difficult, indeed, to conceive how, in the existing state of physiological science—at all events, up to a recent period—any other opinion could be entertained. The lens is a transparent body inclosed in its capsule, without any vessels passing into it. How, then, was it possible to act on it by medicines?

It has been within a few years only that its mode of nutrition was understood. This is effected, as in some of the lower animals, by osmosis through its capsule.

I was first led to doubt the correctness of the doctrine under notice by the experiments of Dr. S. Weir Mitchell,[1] of this city, communicated to the Biological Society, Oct. 3, 1859, and published in the *Am. Jl. Med. Sci.*, for Jan. 1860. In experimenting with frogs by injecting syrup into their cuticular sac he found that the lens of the animal became opaque, and what was most remarkable that when the animal was replaced in water, after some hours the opacity diminished, and, in some instances, the transparency of the lens was entirely restored.

This last circumstance struck me as one which might lead to important practical results, and at all events it pointed out the direction in which our investigations should be made for that purpose.

Additional light was soon shed upon this subject by Dr. Richardson, of London, who, after reading Dr. Mitchell's paper, instituted a number of similar experiments, the results of which he communicated to the Medical Society of London on the 26th of March and 16th of April, 1860.[2] These experiments confirm Dr. Mitchell's results and throw much additional light on the subject. Dr. Richardson shows that cataract may be produced by the injection into the system not only of cane sugar, but also of grape and milk sugar—and likewise of glycerin, alcohol, of solutions of chloride of sodium, of acid urate of soda, and of lactate of soda. Death was also produced when any of these articles were introduced into the system in sufficient quantity.

Dr. R. concludes from his experiments that "as the cataractous appearance is modified by the density of the producing body, and is removable by

[1] On the production of Cataract in Frogs by the administration of sugar.
[2] See Am. Journ. Med. Sci., July, 1860, pp. 257–9.

reversing the conditions which led to it, and as it is producible in a clear lens removed from the body, it is a demonstration that the cataract induced in the different animals is a purely physical—that is to say, osmotic—change."[1]

Dr. Richardson advanced a step beyond this and suggested a practical application of this discovery.

"As a point bearing on the treatment of cataract," Dr. Richardson said, "that inasmuch as temporary opacity produced by exposure of the lens to syrup was removable by an after exposure to water (that is, by changing the position of the medium surrounding the lens), it was worthy of consideration whether an operation for letting out the aqueous humour by a small opening, and refilling the anterior and posterior chambers with distilled water, might not lead to removal of the cataractous condition in the earliest stages."

Soon after this, it was announced that M. Sperino, of Turin, had succeeded in curing cataract by repeatedly evacuating the aqueous humour. This was to some extent a confirmation of the value of Dr. Richardson's suggestion. M. Sperino was not led to this mode of treating cataract by any physiological reasoning, but rather empirically. "He had long derived great advantage from the repeated evacuation of the aqueous humour in cases of iritis, interlamellar keratitis, severe hypopion, staphyloma of the sclerotica, congestion of the choroid and retina (even when attended with exudations), opacities of the vitreous humour, and in pseudo-membranous deposits in front of the lens. Even in some desperate cases of glaucoma attended with commencing cataract, this treatment, useless as regards the loss of sight, was of use, a diminution of the opacity of the lens following the evacuation." M. Sperino promises to soon publish a work which will contain the results of his treatment of cataract by this method and show the kind of cataract to which this operation is applicable.

M. Sperino's operation consists in puncturing the cornea and preventing the puncture from uniting by introducing at short intervals into it a small probe, thus keeping up a drain of the aqueous humour. Mr. Hildige, of Dublin, professes to have tried this plan and without success; but he did not adopt M. Sperino's process. On the contrary, he made a fresh puncture at intervals, and these repeated punctures caused so much irritation and inflammation that he was compelled to desist.

These observations throw new light on the pathology of cataract, and seem to hold out a hope that remedial means may be discovered of arresting the progress of that disease, and, perhaps, even of restoring the transparency of the lens; but the physiological law which presides over the changes in the lens, and which was to guide us in our search for the means of controlling these changes, required to be more clearly determined.

In conversing, a short time since, with my friend Prof. Jackson on this subject, he informed me that experiments similar to those of Dr. Mitchell had been previously made by Kunde, and referred me to Claude Bernard's "*Leçons sur les proprietés physiologiques et les alterations pathologiques des liquides de l'organisme*," for an account of them.

In M. Bernard's lecture, delivered on the 11th of Dec. 1857, that eminent physiologist, to whose experimental researches we are indebted for

[1] It is just to Dr. Mitchell to say that although he believed that the direct contact of the sugar with the lens was essential to the production of what he called sugar cataract, he recognized the fact that the phenomenon was produced by osmotic action.

many advances in physiological science, merely briefly notices Kunde's experiments, without stating when they were made. In that lecture he, however, treats of the physiological importance of water to the organism, and the doctrines which he there develops seem to me to afford a physiological explanation of the production of cataract and to point out the direction in which our investigation for the means of remedying that condition should be directed.

M. Bernard shows that water is an essential component of all living organism—it is the necessary vehicle for the materials which enter into the double movement of nutrition and excretion—without which life cannot be maintained. "Independently of their special properties, the organic fluids," he says, "are allied by a general character; all owe their first physiological importance to the water they contain; before being useful in consequence of the substances which they may hold in solution or in suspension, they are first useful as fluids."

M. B. states that water constitutes nine-tenths of the whole weight of the human body; but the proportion of water to the solid constituents varies in the different fluids, being from 80 to 90 per 100 in the blood; 98 to 99 per 100 in the gastric juice; 70 to 80 per 100 in milk, &c.

Mr. B. next investigates the influence which the quantity of water in the organism exercises on physiological phenomena. To do this, he says, "two processes present themselves to the experimenter; one consists in detracting water from the body, the other in adding water to it. The first is difficult to accomplish. Nevertheless, Dr. Kunde has effected this in frogs, and observed some singular results. His process consisted in introducing into the intestinal canal of these animals some sulphate of soda or sugar; endosmotic action was thus induced which caused a part of the water of the blood to flow into the intestine; the blood was thus deprived of a portion of its water."

"One of the first results of this experiment was the loss of transparency of the crystalline—the animal becoming blind. This result quickly disappeared when the frog was replaced in water. Convulsions also resulted from this impoverishment of the blood of its water, very probably from the subtraction of the fluids which bathed the nerve, and these convulsions disappeared when the water which the system has lost was restored to it."

M. Bernard injected water into the veins of dogs, thus increasing the normal proportion of water in the system, and found he could do this to a considerable extent, without ill consequences; but so soon as the proportion of water exceeded certain limits, pathological results followed. Some of the secretions were first diminished, and as more water was injected, these secretions became entirely suspended, convulsions then supervened, and finally death.

It is thus seen that while the proportion of water to the solid constituents of the blood may vary within pretty extensive limits, without injurious consequences, yet so soon as these limits are transcended, pathological conditions at once result.

The only one of these which at present interests us, is the opacity of the crystalline lens following the diminution of the proportion of water in the blood below its physiological limits.

Dr. Mitchell supposes that the direct contact of the sugar with the lens is essential to the production of the phenomenon in question; but this is disproved by the experiments of Kunde and Richardson, which show that other articles that cause excessive exosmosis of the fluids produce the same

phenomenon; and, further, Hepp, who examined a diabetic cataractous lens, extracted by Stoeber at the ophthalmological clinic of Strasbourg, could not find in it a trace of glucose.[1]

Dr. Mitchell states, that the mere abstraction of water from the lens is insufficient to cause opacity, because the lens when dried does not become opaque. This statement, we believe, requires some qualification, and at all events when excessive exosmose from the lens is produced, the superficial nucleated cells and lens tubes are as a consequence emptied of their contents, and the structure of the lens is thus so altered as to render this body more or less opaque. This vacuity of the nucleated cells and lens tubes has actually been observed by microscopists in the examination of cataractous lenses.

Is this opacity of the lens then the consequence of the impoverishment of the fluids of the body of their water, which causes an excessive exosmosis of the more fluid contents of the lens, and impairs the nutritive functions of that body?

There are a number of facts which seem to lend support to this view.

Cataract most commonly occurs in advanced life, at which period the proportion of fluids to the solids is considerably diminished, and as correctly observed by Mr. Dixon, when the lens becomes cataractous in old persons, "the change seems to consist in a process of drying and atrophy of its fibres."[2]

Again, it is now a well-established fact, that cataract is a frequent consequence of diabetes. Is this not to be explained by the excessive excretion of fluid by the kidneys; and if this opacity is not always produced, may it not be owing to the water being replaced by the great quantity ingested, uncontrollable thirst being a constant attendant on the disease?

M. Bernard states that it is difficult to deprive the organism of its water, but he has overlooked the fact that this may be effected by certain medicines, as croton oil, tartar emetic, and the hydragogue cathartics, and is the constant result of several diseases, as diabetes, malignant cholera, profuse serous diarrhœa, leucorrhœa, &c.

In malignant cholera the exosmose of water into the intestines is enormous; the blood is so impoverished of its water that it becomes thick and dark as molasses. Is opacity of the lens one of the consequences of the loss of fluids in this disease? We are unable to answer this question, for we are not aware of any examination of the lens having been made after death from this disease. But we have often noticed a dulness and loss of transparency of the cornea, preceding death from this affection.

Artificial cholera may be produced by large doses of croton oil, or by repeated doses of emetic tartar, and experiments might be made on animals which would determine this point; and we would ask the attention of experimental physiologists to the subject.

Long continued copious serous diarrhœa, profuse leucorrhœa, and other exhausting fluid evacuations, impoverish the organism of its fluids, and, if our views be correct, must favour the formation of cataract.[3]

If it be objected to this that no such result has ever been noticed, let it be remembered that it is only within a very few years that the connection

[1] Lecorché, *Archives Gen.*, May, 1861, p. 737.

[2] Guide to the Practical Study of Diseases of the Eye, 2d ed., p. 216.

[3] There may be various other obscure diseases, which also alter the normal density of some of the fluids, and thus impair osmotic action.

between diabetes and cataract has been recognized, and that when attention shall be directed to this subject a similar connection may be discovered in other affections.

Should further investigations show that the long continued impoverishment of the blood of its water impairs the osmotic nutritive functions of the lens so as to produce opacity of that body, may we not hope that in some of such cases, by supplying to the organism its lost water, or by adopting the suggestion of Dr. Richardson or the practice of M. Sperino, the nutritive actions of the lens may be restored, the progress of the opacity arrested, and even, as occurred in the experiments of Kunde, Mitchell, and Richardson, that its transparency may be restored.

In very advanced age, it may not be possible to restore the proportion between the fluid and solid constituents of the body, for to do this would be to rejuvenate the individual, and senile cataract may therefore be regarded as beyond our therapeutical resources, as will be also those cases when the affection has advanced to that stage where the lens tubes have become broken up and actual structural alterations have taken place.

Congenital and traumatic cataract must be equally intractable to medical treatment, neither resulting primarily from impaired nutrition. The former is the consequence of arrest of development; and the latter is produced by exudation of lymph on the capsule, the result of inflammatory action. The capsule is then, of course, rendered incapable of performing its osmotic functions.

But when cataract occurs prior to senility—without any obvious cause—when the opacity has not far advanced, and especially when the impaired nutrition causing the opacity, is the sequel of exhausting evacuations, is it unreasonable to hope that the progress of the change in the lens may be arrested and even a retrograde metamorphosis effected?

The loss of transparency of the lens almost always commences in the layer of nucleated cells which connect the body of the lens to its capsule, the anterior marginal cells being first affected—the opacity proceeds in a centripetal direction implicating next the superficial softer fibres, and it is usually not until a late period that the denser fibres constituting the nucleus become affected. The mere arrest of the affection in its early stages while the nucleus is still clear, would be a great boon to the patient.

We might dwell further on this subject, for many points remain still to be developed, but we abstain for fear of too long trespassing on the patience of the Fellows of the college.

We shall besides have accomplished our object if we have succeeded in awakening attention to the subject—if we have excited the suspicion of our hearers that the conviction under which we have long rested of its being beyond the therapeutic resources of our art to retard, or in any degree control the formation of cataract, may not be well founded, and if we have indicated the proper direction in which our researches should be pushed in order to discover the means, if such exist, of attaining this very desirable object.

ART. XI.—*Summary of the Proceedings of the Pathological Society of Philadelphia.*

1862. *Feb.* 12. *Cysto-Sarcoma of Ovaries with Tubercular Degeneration; Tubercular Tumours upon the Parietal Peritoneum.*—Dr. A. H. SMITH presented this specimen, and gave the following history of the case:—

Mrs. R. aged 42, married 20 years, sterile, of nervous bilious temperament, delicate constitution, never robust, though not suffering at any period of her life from any manifest disease, became aware for the first time about 18 months ago of a decided enlargement of her abdomen, unattended at that time by any marked inconvenience or interference with the functions of the abdominal viscera. For two months after this discovery, the disease continued to progress, and finding it to interfere with her general health, she placed herself under the care of Dr. Ellwood Wilson. She was at that time quite feeble, with a miserable appetite, emaciated, skin cool and clammy, sleeping badly, languid and incapable of any active exertion. On examining the abdomen, which was greatly distended, there were found by careful manipulation two distinct tumours occupying either iliac region, that on the right side being much the larger. The patient was not at that time, or at any period afterward, in a fit condition for an operation for extirpation, even had such a remedial means been entertained. The abdomen continuing to enlarge, and the nature of the disease being clear, she was tapped on the right side and a considerable quantity of water drawn off, which gave great temporary relief; the left tumour did not appear to increase appreciably. The operation was repeated twice afterward upon the same tumour without the supervention of any other disease, either organic or functional. She gradually sank from mere exhaustion, and died on the 10th inst.

Yesterday, at Dr. Wilson's request, I made the autopsy for him, Drs. Morton and Scholfield being also present.

There was considerable emaciation; the abdomen much distended. Upon opening it, and removing about a gallon of straw-coloured serum, the lower two-thirds of the abdominal cavity were found occupied by the ovarian masses, the left being the larger, and extending over the median line. The right ovary consisted mainly of a firm fibrous mass, having an excavation of the capacity of about a pint and a half, opening by an orifice an inch in diameter, the effect of one of the punctures with the trocar, probably the last, as there was no extensive cyst remaining upon this side, merely a few scattered over the posterior surface of the tumour. The Fallopian tube of the right side and the cornu of the uterus into which it was inserted were both in a healthy condition. The left ovary, which had never been punctured, consisted of numerous cysts varying in size from a pigeon's egg to a large orange, imbedded in a mass which had at one time evidently been similar to that of the tumour upon the right side, and the external or iliac portion was still firm, while the inner half was in a state of degenerative softening, readily torn and in places of a pultaceous consistence; the oviduct of this side was greatly enlarged, as also the cornu of the uterus, and both structures exhibited the same degeneration. The cervix uteri was healthy.

The most interesting feature in the examination was found in the appearance of the peritoneum lining the anterior parietes of the abdomen, which

was studded with numerous excrescences varying in diameter from a few lines to an inch and a half, the smaller ones being spherical, the larger ones flattened and slightly concave upon their upper surface; they were of a pinkish colour, and the peritoneum surrounding them was considerably injected, though nowhere exhibiting evidence of inflammatory action either recent or old. The larger of these growths were seated near the umbilicus and beneath the hypogastrium, the smaller were scattered over the rest of the anterior peritoneal surface, none of these being found as far posteriorly as the iliac fossæ. The omental and visceral peritoneum was perfectly healthy and free from any of these growths, except that from the lower surface of the transverse colon was attached a pediculated pyriform cyst of the size of a goose egg, containing a thick gelatinoid transparent fluid. There was not the slightest evidence of disease in any of the other abdominal or thoracic viscera; no trace of tubercular deposit.

Upon examining these peritoneal growths they were found to consist of sacs, with fibrous walls about two lines in thickness, apparently a mere thickening of the serous membrane, within which was a creamy fluid, that proved under the microscope to be softened tubercle. The microscopic examination of the degenerated tissues of the ovary, oviduct and cornu of the uterus, proved it to be the result of tubercular softening.

I have carefully searched, and can nowhere find mention made of similar tumours to those found upon the peritoneum, nor in fact any reference to the occurrence of growth from the serous lining of the abdominal walls; tubercular tumours from the visceral peritoneum, however, being mentioned by several authors.

April 22 *Stricture of the Pylorus and Hemorrhagic Erosion of the Gastric Mucous Membrane.*—Dr. JOHN ASHHURST, Jr., presented and read the following communication from J. Campbell Shorb, Assist. Surgeon U. S. Army, Benicia Arsenal, California:—

A case, singular and complicated enough to demand a detailed history of its progress and termination, occurred a few weeks since in the U. S. Hospital under my charge, at Benicia Barracks, California.

George Steinburgh, a native of New York, a farmer by occupation, a private soldier of Company C, 4th Infantry, California Volunteers, aged twenty-four years, was admitted into the hospital on Nov. 13, 1862.

He made, in substance, the following statement in regard to his illness: Up to a very recent period his health had been excellent; but his stomach had suddenly grown irritable, and rejected almost everything he ate. This condition had lasted almost a month. His appetite was variable; often it was insatiable, sometimes entirely wanting; but whether he ate much or little, the same result was certain to follow, vomiting at a period varying from half an hour to two hours after his meals. His habits were strictly temperate, and always had been so. His physical appearance did not denote the existence of any grave disease. He was fleshy, but a little pale, and very dark beneath the eyes. His pulse was somewhat feeble, in all other respects natural. His tongue was moist and covered with a thin white fur, becoming somewhat yellowish at its base. His gums were pale, and, on pressure, bled easily. He was troubled with a slight headache almost constantly, and a mild fever, setting in toward sunset, which terminated generally about 9 P. M. in a slight sweat. He had daily an operation from his bowels, but it was scanty and clay coloured. He had no pain whatsoever over the epigastrium, except during the few moments immediately preceding

an attack of vomiting; even then it was more a sense of uneasiness or oppression than actual pain. There was no tenderness evinced on pressure during the whole course of his sickness, until three or four days immediately before his death.

The first plan of treatment was as follows: the case was supposed to be one of great irritability of the stomach, caused by congestion of its mucous surfaces, the result of a sluggish condition of the portal capillaries; and a purgative dose of hydrarg. chlor. mit. was ordered to be taken at once to arouse the portal capillaries, followed by two grains of blue mass, every night to render this action persistent. This treatment was continued for several days, but no improvement was manifested in any one respect In fact, the irritability had markedly increased; and there was every reason to believe the medicine acted kindly, for the stools, though still small, had assumed a healthy natural colour. Abandoning the idea that the symptoms were due to the condition described, I imagined they might originate in some functional disorder of the spinal column, or other centres from which nervous supply is furnished the stomach. He was blistered behind the ears, cupped and blistered on either side of the spine, at a point corresponding to the cœliac axis, or position of the semilunar ganglia, but no good result followed.

It did not seem probable that the irritation was dependent on any particular article of diet, for solid or fluid, digestible or indigestible substances gave rise to the same phenomena. However, a strict diet was directed and persevered in for some days, the result being as unsatisfactory as ever.

The case was then treated as one of perforating ulcer of the stomach; though many doubts arose in reference to the question whether the existence of such a condition would be attended with the peculiar symptoms found in the present case. There was no circumscribed pain; no tenderness on pressure; no sign of blood in vomiting, up to this period. The matter ejected from the stomach was food partially digested, mucous secretions, at times quantities of a glairy fluid or a liquid resembling saliva.

Bismuthi subnitras and argenti nitras were administered according to the following formula: ℞.—Bismuthi subnitras ℈ij; argenti nitras gr. x; extract. glycyrrh. pulv. gr. v; acaciæ gum. mucil. q. s. Misce et fiat massa in pilulas No. x dividenda. Sig.—One pill every four hours.

This prescription was continued for four or five days, but the man grew steadily worse. The history of the case precluded the probability of its being chronic gastritis or a subacute variety of that disease. However, I directed a large blister to be placed over the epigastrium, hoping that some benefit might result from its action; issuing, at the same time, strict orders in reference to his diet, and giving him alternately small doses of creasote and chloroform in water.

A new and fearful symptom, at this stage, was added to the rest; viz., hemorrhage from the stomach. The blood was ejected by active vomiting at first. Large quantities of very black and thickly clotted blood were thrown up at gradually decreasing intervals. I tried opium and lead, ergot and kino, tannin and iron, severally and in combination; but, far from checking, they did not seem to lessen the discharge. It now came up by a species of regurgitation; out of his nostrils, out of his mouth, in one unceasing flow. He weakened rapidly; a series of fainting spells came on, terminating at last in a mortal syncope. He died at 3 o'clock A. M., on Dec. 13, forty-eight hours after the first appearance of the hemorrhage, and thirty days from his admission into the hospital.

Autopsy made nine hours after death.—The body was of snowy whiteness and but little emaciated. Rigor mortis was well marked. The brain was not examined. The heart was healthy; also the lungs, except at the summit of the lung where there was a slight adhesion, the result seemingly of an attack of pleuritis in early life. The liver was natural in size and consistence, though paler than it ordinarily is. The spleen was healthy; its capsule flaccid, and its parenchyma of proper colour and consistence.

The stomach, when first exposed to view, resembled a section of the transverse colon, or a small sack with thin semi-transparent walls containing an inky liquid. It was much diminished in size, and wonderfully so in thickness. On opening the organ I found a condition different from anything I had ever seen, and answering only to a disease described by Rokitansky [*Pathological Anatomy*, Syd. Soc. Translation, vol. ii. p. 34], and denominated "Hemorrhagic erosion of the gastric mucous membrane."

The first great sign of disease evinced on inspection was the wonderful loss of substance. The whole organ emptied of its liquid contents did not weigh over one ounce and a half, probably less than one-third of the weight of an ordinary adult stomach.

A coagulum, brown in some places, growing black towards the pylorus, covered the whole internal parietes. This, removed with the finger-nail or scalpel, revealed immense numbers of small round spots of various sizes, the largest corresponding to the diameter of swan shot, and the smallest to the diameter of clover seed, increasing in number from left to right until within half an inch of the pylorus, they appeared in thickly set clusters leaving no interstices between them. Some of these, apparently, were entirely denuded of mucous membrane; while others and the greater number were still covered by the membrane, but it was much diseased, being dark red, and so soft that it broke from the forceps, and, squeezed between the fingers, became pulpy. Careful examination was made for ulcers, and three or four were found. These were for the most part quite superficial, but one seemed to have eaten through the membrane, having for its base either the submucous cellular tissue, or the muscular structure itself. Underlying the lesser curvature, midway between the cardiac and pyloric orifices, there was a bright red circular spot an inch and a half in diameter, where the mucous membrane, though seemingly congested within one degree of hemorrhage, was evidently more healthy than in any other portion.

At the pylorus, there was found an impermeable stricture; and it was this condition I believe that gave rise to the whole series of morbid processes that eventuated in death. There was a cadaveric contraction of the muscular fibres encircling this outlet, but the condition found was altogether different from that contraction; not even admitting a small sized probe. Most careful examination was made for signs of previous ulceration, but no cicatrices could be discovered.

The stricture had been gradually growing worse all the time, and for days before death had effectually and absolutely cut off all communication between the stomach and duodenum. Immediately under the mucous membrane covering this sphincter, there was an effusion of a yellow liquid, resembling bilious matter, and in quantity certainly not over half a fluid drachm. No sign of even the beginning of malignant disease could be discovered; in fact examination failed to reveal anything that could clear up the mysterious cause of this morbid condition.

In the progress of the case, it was remarked that no bilious matter was ejected from the stomach; now the reason appeared obvious; the commu-

nication was cut off between the duodenum and the stomach; and it seems singular that this fact alone did not lead to the suspicion that there was some functional or organic disorder of the pylorus.

The erosion of the gastric mucous membrane can scarcely be deemed in this case an idiopathic affection. The low condition of the system caused by the pylorus preventing an egress of nutritive material from the stomach, powerfully predisposed to the production of the disease; and then the wear and tear of the stomach in the ceaseless agonies of vomiting, must have kept the organ constantly in a state of congestion bordering on hemorrhage; a condition of things which if continued must always result in serious organic mischief, and ultimately sap the foundations of life.

May 2. *Phthisical Vomica in Base of Right Lung.*—Dr. JOHN ASHHURST, Jr., reported the following case:—

J. L. F., aged 50, a seaman, admitted to the Pennsylvania Hospital on January 27th, 1862. The diagnosis made was phthisis, but at no time during life was an abscess suspected, probably from attention not having latterly been directed to the base of the lung. He died on the 21st of May from colliquative diarrhœa, and an autopsy was made 7½ hours after death. A very large abscess was found in the mediastinal space communicating by a narrow passage with another in the lower lobe of the right lung. Several patches of tubercle with commencing softening were found in the upper portions of both lungs.

In the liver were several accumulations of puriform liquid, which, however, under the microscope, showed no pus cells whatever.

There was no communication from the liver to the mediastinal abscess.

The pericardium was completely adherent. The heart itself presented no evidence of disease.

The large intestine was very much ulcerated, but was not found to contain any tuberculous deposit.

The other organs which were examined appeared normal.

Case of Acute Poisoning by Alcohol.—Dr. JOHN ASHHURST, Jr., exhibited the brain of the patient, and read the following account of the case:—

Julia H., aged about three years, was admitted into the Pennsylvania Hospital about twenty minutes past ten on the evening of Sunday, May 25th.

Dr. Joseph Shippen, who was called to the case before its admission, has courteously furnished me with the following particulars.

The child had been given by her mother, who was herself excessively intoxicated, two teacupfuls, I suppose about half a pint, of whiskey; two physicians had been sent for, but had successively resigned the case as hopeless without any effort, and Dr. Shippen was therefore the third practitioner who had seen the child. He found it cold, almost pulseless, and in a state bordering on complete collapse. He instantly administered thirty minims of the aromatic spirit of ammonia with a teaspoonful of the fluid extract of valerian, with the effect of rousing the patient and causing a profuse emesis. He also plunged the child up to the breast in a hot bath and retained it there until the capillary circulation of the skin became more active, as indicated by a general redness of the surface. When vomiting took place, along with the contents of the stomach was brought up a large quantity of frothy mucus expelled from the air passages.

When admitted to the hospital, although partially reacted, the child's

condition was critical in the extreme. The skin, though not absolutely cold, was clammy and relaxed. The pulse extremely weak and so frequent that it could scarcely be counted; the breathing exceedingly rapid, and each expiration followed by a peculiar moaning sound; the pupils widely dilated and immovable. The child was delirious and disposed to be restless. A sinapism which had been applied to the chest had not even reddened the skin. Having placed the child in bed and covered it warmly, I directed turpentine stupes to its chest, front and back, and large mustard plasters to its lower extremities: carbonate of ammonia in 1¼ grain doses was administered every quarter of an hour. Auscultation at this time showed great congestion of both lungs, without, however, any absolute inflammation. The action of the heart was rapid and feeble. About three-quarters of an hour later, on again applying my ear to the chest, I found mucous rales throughout, showing that effusion was rapidly going on. I was called to the child again at twelve o'clock, and on entering the ward found that she had just expired.

Neither the turpentine nor the mustard had in any degree reddened the skin. The left arm appeared much swollen and mottled.

An autopsy was made fourteen hours and a half after death with the following results. The whole body appeared bloated and livid in patches.

Head.—The membranes of the brain were much congested, the venous trunks being gorged with black blood. The brain substance was soft, but perhaps not more so than customary in children. The minute vessels of the dura mater were beautifully injected; the ventricles appeared natural; the brain substance studded with small red spots.

Thorax.—The lungs very much congested, of a dark-red hue, and the air passages filled with frothy mucus. The lung tissue floated in water, but floated almost entirely beneath the surface. The right cavities of the heart contained large clots of a "currant jelly" colour, and the great venous trunks were filled with dark fluid blood. The left side of the heart and aorta was empty.

Abdomen.—The stomach presented a patch of very slight redness near its cardiac orifice, but throughout the remainder of its extent appeared perfectly healthy.

The bladder was very much distended with urine. The liver rather pale; the kidneys and spleen healthy. The serous membranes throughout the body were completely free from adhesions.

The immediate cause of death in this case seems to have been the stoppage of respiration from accumulation in the air passages of mucus, which in so young a child could not be expectorated.

"The quantity of alcohol required to destroy life," says Taylor [*On Poisons*, &c., 2d ed. p. 726], "cannot be fixed." It must depend on the age and habits of the person. The smallest quantity known to have proved fatal was in the case of a boy, æt. 7, who swallowed two wine-glassfuls of brandy (between three and four ounces). Here death took place in thirty hours.

Dr. Percy records a case in which the post-mortem appearances were almost precisely the same as in mine.

According to Mr. Bedingfield, as quoted in *Edinb. Med. and Surg. Journal*, xii. 489, the patient will recover if the iris remain contractile, but if it is dilated and motionless on the approach of a light, recovery is very improbable.

In acute cases (such as mine), the mucous coat of the stomach is not inflamed; when it is so, Dr. Ogston considers it rather to arise from fre-

quent drinking to excess, than from the dose which may finally prove fatal. [*Edinb. Med. and Surg. Journal*, xl. 292.]

An overdose of alcohol may prove fatal in a few minutes, or not until after several days. Fatal cases, however, generally terminate within twenty-four hours.

June 11. *Old Apoplexy; Pericarditis; Single Kidney; Bifid Uterus.*—Dr. PACKARD exhibited a kidney, bladder, and uterus, with the following history of the case from which they were derived:—

Mrs. M. L. C., æt. 53, had suffered for several years with symptoms indicating cerebral disease. Some doubt existed as to whether there was not also some lesion of the stomach. The immediate cause of death was exhaustion from suffering and imperfect nutrition.

Body very much emaciated. Some little rigor mortis. Skull very thick, and destitute of diploë. There was some turbid serum under the arachnoid. The brain matter generally was softened and wet, the right side being more so than the left. In the corpus striatum of the left side there was an apoplectic clot, perhaps one-third of an inch in diameter, evidently of some standing, and the surrounding cerebral substance was somewhat wrinkled. The right lobe of the cerebellum was soft, the markings of the arbor vitæ curiously indistinct, and the corpus dentatum wanting. All the arteries about the base of the brain were atheromatous.

Both lungs were healthy, although the left was somewhat adherent at its apex, and a small tubercular deposit, apparently in process of cretefaction, was observed in the corresponding lung-tissue.

The heart was large and fatty. Between the layers of the pericardium, around the base of the organ, lymph was deposited, evidently long ago. It was in sheets, with a smooth granular surface, and could easily be stripped off. One flap of the mitral valve was adherent. All the other valves were healthy.

On opening the abdomen, an enormously thick and fatty gastro-colic omentum was observed. It had adhesions at irregular points to all the viscera, including the uterus, and to the abdominal walls.

The stomach lay in a nearly vertical position; it was entirely normal. The liver was fatty; a large gall-stone distended the gall-bladder. The spleen was small, and upon section showed very numerous specks of whitish deposit like tubercle; microscopic examination did not, however, reveal any special type of cell.

The left kidney was wholly wanting, with its capsule; the organ of the right side was of more than average size. No sign of the left ureter existed in connection with the bladder, which was large and flabby, but otherwise normal.

The uterus was bifid, the separation between its lateral halves extending almost to the lower extremity of the organ; the os uteri was single. Just below the posterior lip of the os uteri there was a little transverse bridle of mucous membrane, like a perforated valve. It seems strange that this should have been unruptured in any of her four confinements.

As regards this abnormity of the kidney, it will perhaps be remembered that at the first meeting of the society in October of last year, I exhibited a specimen of a very similar character, taken from a male subject.

Case of Aneurism occupying the Popliteal Space; operation; death on the 23d day.—Dr. JOHN ASHHURST, Jr., exhibited the specimen, and read the following report of the case:—

Josiah Williams, aged 50 years (for the opportunity of presenting whose case I am very much indebted to Dr. Robert S. Kenderdine, one of the attending surgeons to the Philadelphia Hospital), was admitted to that institution on the 10th of December, 1861, complaining of pain and swelling of the posterior part of the left knee. He was referred to the medical ward as a case of chronic rheumatism, and was there treated by three of the attending physicians in succession, without any change being made in the diagnosis of his disease. He stated that the swelling had originally begun on either side of the joint, but had before long involved the whole ham in one common tumour.

In the beginning of May, 1862, the resident physician in charge of this patient thought he discovered fluctuation at one point of the tumour, and accordingly introduced a bistoury. No pus, however, followed the withdrawal of the instrument, but a small quantity of a serous fluid.

On the 8th of the same month the patient was transferred to the surgical ward, and on that day was first seen by Dr. Kenderdine.

The man was of large frame, pale, with very prominent eyeballs; the left limb much bent at the knee; the tumour very large, and filling the whole popliteal space; the foot much swollen.

Deep pulsation could be felt upon firmly compressing the tumour, but there was no aneurismal thrill. The skin was very much discoloured and livid, and several openings were shown by the probe to communicate with dead bone. The exploring needle was twice introduced without eliciting any information.

Dr. Kenderdine informs me that from the moment he saw the case, he believed it to be aneurismal; and that he had resolved, in view of there being already an opening made into the sac (in the medical ward, a few days previously), to enlarge this incision, and should his diagnosis prove to be correct, proceed at once to turn out the clots, and tie the vessel at the points of entrance and exit.

As it happened the aneurism, for such it proved to be, burst while it was yet being examined, and of course the operation was at once proceeded with, the man having been brought under the influence of chloroform.

I should mention that in view of the disease of the bony structure, amputation had been proposed to the patient, but positively refused by him.

The incision was rapidly made, and the clot turned out, when the entering orifice of the artery became apparent. Several ligatures, which were successively applied, cut through the diseased coats of the vessel, and it was not until the artery had been dissected free from the surrounding tissue, and traced into healthy structure, that it could be finally secured; a large branch coming off immediately above, was also tied. The orifice of exit, although carefully searched for, could not be found; and, therefore, the wound being stuffed with lint, dry above and below wet with the solution of the persulphate of iron, was loosely brought together with adhesive strips, a provisional tourniquet placed around the thigh, and the limb elevated.

The contents of the sac, when removed, filled an ordinary hand basin. There was not much arterial blood lost during the operation, and the man, under stimulus, reacted well. On the next day the collateral circulation was fully established, and the swelling of the foot was considerably less.

On the fourth day some diarrhœa occurred, which, although kept in check by opiates and astringents, continued from this time. The ligatures came away upon the tenth day, and the man continued as favourably as could be desired until the 28th of May, when, from no apparent reason, he began to sink, and died three days subsequently, the 31st of May, and the twenty-third after the operation.

An autopsy showed the arteries above and below to be filled with firm coagula, and the sac to have very much contracted. The articular surfaces of femur, tibia, and fibula were greatly diseased.

The spleen was softened, and contained a collection of matter resembling pus.

The operation performed in this case is of no recent origin. Not less than 1530 years ago, Antyllus, to whom is attributed by Sprengel the invention of the ligature, operated for aneurism by tying the artery above and below, opening the tumour, evacuating its contents, and introducing such substances as would promote suppuration.

Philagrius, some years afterwards, modified this proceeding by dissecting out the entire mass, after tying the vessel both above and below.

Mr. Porter, of Dublin, in his treatise on aneurism, published about twenty years since, advocates the operation by opening the sac in certain cases of diffused and traumatic aneurism; but in the immense majority of cases recommends the operation of Hunter, as the best and only justifiable proceeding.

Mr. Syme, of Edinburgh, in his charming *Observations in Clinical Surgery*, published last year, gives several cases in which he operated by this the "old operation" in various parts of the body with most gratifying success, and expresses the opinion that the "generalization" in favour of the adoption of the Hunterian method in every case is "no less unjust than hasty."

In cases of popliteal aneurism he prefers still the ligature on the cardiac side of the tumour, as in the ordinary operation; but the case I have had the honour of reporting was exceptional. The sac was already opened, and suppuration would, therefore, almost certainly ensue. Even had the sac not been opened, the size of the tumour was so great as to render absorption at least problematical; and, under these circumstances, I think every one will agree, upon careful reflection, that but one of two courses would have been justifiable; either the operation as performed, or amputation, which, as I have already mentioned, was peremptorily declined.

The occurrence of gangrene after the ligature of arteries is due, according to Porter, to the pressure from the tumour, and not to the impediment to the arterial circulation. It is moist gangrene from venous congestion, not dry gangrene, as in the cases of embolus which are occasionally met with.

After the Hunterian operation the tumour frequently increases rather than diminishes in size; and by coagulation the pressure becomes continually greater, while, by the old Antyllian method, the pressure is at once removed, and the probability of gangrene is almost entirely done away with.

The fear of hemorrhage during the operation should not deter any one, for a single finger will easily control the most powerful arterial jet.

Subpleural Abscess connected with Ununited Fracture of Eighth Rib.—Dr. Agnew presented, for Dr. C. H. BOARDMAN, a specimen, and gave the following history of the case from which it was derived:—

The accompanying specimen, consisting of an abscess beneath the pleura,

with a fracture of the eighth rib, was taken from a negro girl, æt. 22, a patient in the medical wards of the Philadelphia Hospital. Its history, as nearly correct as possible, is as follows:—

The girl was admitted to the hospital February 15, 1862. She complained of a continuous acute pain in the right side, and was suffering at the same time with a cough and general debility; in fact, she was almost in a typhoid condition. Her appearance was decidedly strumous.

Upon examination an opening was found upon the right side, apparently communicating with the cavity of the thorax, and caused by a fracture of the eighth rib, which was ununited, and carious at its broken extremities. It discharged constantly and copiously a highly offensive sanious pus. The thorax was *somewhat* dull on percussion; most dull on the unaffected side, and there were no evidences of the participation of the lung itself in the injury. Auscultation revealed the physical signs of phthisis, best marked upon the left side, which was borne out by the general symptoms, while a *plashing* was readily recognized upon the injured side. The pulse was small and frequent; the general condition feverish and restless. The patient complained only of pain upon the right side, but was somewhat annoyed by difficulty of expectoration and by participation of the larynx in the tuberculous affection. Questions elicited the following account: Three or four months previous to her admission to the hospital she had been violently kicked in the side and beaten by her master or employer in Delaware. By degrees the abscess had been developed, while her health had suffered to a corresponding extent. No effort had been made to procure a union of the fracture; of the existence of which, indeed, she had not been aware.

Her treatment, in addition to tonics and stimulants, consisted of counter-irritants, principally, with a view to relieve the inflammation of the pleura which was supposed to exist, the diagnosis being pleurisy with effusion. Temporary relief only was obtained; the patient remained stationary for a few days, when she gradually sunk until she died on the 7th of March, having lived in the house three weeks.

An autopsy was made with the following result: The opening in the right side communicated, as had been supposed, directly with the corresponding pleural cavity. The sac was covered over most of its surface with fringes of greenish imperfectly organized lymph, and contained about two pints of the pus which had manifested its presence so profusely during life. The lung was much compressed, and forced into the upper part of the thorax. The adhesions were remarkably firm. In the left thoracic cavity, upon the removal of the lung, which was highly tuberculous, the accompanying specimen, which had not been recognized during life, was discovered. It consists of an abscess between the intercostal muscle and the pleura, pointing within, and apparently nearly ready to burst. Neither it nor its cause, the fractured rib, were discovered until post-mortem, as the symptoms and complaints of the patient had confined all attention to the opposite side.

No pathological condition was discovered in any of the other viscera.

June 25. *Valvular Disease of Heart.*—Dr. JOHN ASHHURST, Jr., presented a specimen of this, and read the following history of the case:—

J. M. R., æt. 53, a house-carpenter by trade, was admitted into the Pennsylvania Hospital on the 10th of June, 1862. For many years he had suffered from hæmorrhoids, which latterly, however, had not bled. In

1840 he was laid up with a cold which lasted between five and six weeks, and afterwards suffered from chronic diarrhœa, which annoyed him more or less for six years. From 1846, however, until last February he had enjoyed good health; on the 22d of that month he had caught cold again, and had been ailing since.

His principal complaint now was of excessive shortness of breath and debility. He was much swollen about the lower extremities, and had also some œdema of the trunk.

His liver was evidently enlarged; his urine contained no albumen; auscultation betrayed a cardiac murmur, not however very striking, and slight dulness; the crepitant râle and friction sound at the lower part of the left lung, posteriorly, showed a slight amount of inflammation; bronchophony was present, but not marked.

A stimulant and tonic treatment was resorted to, and no change was apparent until the morning of the 12th, when his body, especially his arms and legs, were found covered with numerous vibices.

Muriated tincture of iron, with oil of turpentine, and increased stimulation were now employed, but dyspnœa gradually increased until his death, which ensued on the 14th about 4 A. M.

An autopsy was made 13½ hours after death with the following results:—

Thorax.—The heart was much enlarged and fatty; there was an enormous deposit on the mitral valve; very large clots, partly fibrinous and partly resembling currant jelly, filled the ventricles and the aorta and pulmonary arteries. The lungs appeared healthy, except in the lower lobe of the left lung, which was consolidated seemingly from an old pneumonia. There was great serous effusion in the cavities of both pleura and pericardium.

This effusion, the fatty condition of the heart substance and the depressed state of the circulation, no doubt masked the abnormal sounds, which certainly did not indicate the great amount of valvular disease which was found in the mitral region.

Abdomen.—The liver was enlarged and fatty; the spleen large and lobulated; the kidneys fatty, especially the right. There was considerable serous effusion into the cavity of the peritoneum. The other organs examined appeared healthy.

It was suggested by Dr. Levick that the petechiæ and vibices in this case were due to the depraved state of the blood, resulting from partial putrefaction of the heart clots while life was yet present. Whether such a connection can justly be traced I am not prepared to say; but that petechiæ and fibrinous clots in the ventricles co-exist I am sure is often the case.

On the 8th of January last I reported to the Society the case of an old man who died with a very similar condition of affairs. He too had for a long time suffered from an affection of the lungs, which, however, had not given him much annoyance, and which under treatment for cystitis became suddenly covered with petechiæ, and he died within twenty-four hours. At the autopsy "both ventricles of the heart were filled with enormous fibrinous clots which extended into both the aorta and pulmonary artery, nearly filling their entire calibre." [*Am. Journ. of Med. Sci.* for April, 1862, p. 421.]

It is very much to be regretted that in the case to-night reported the sounds of the heart could not have been more accurately noted; but the patient was so restless, groaning, tossing himself about, and for some time before death almost unmanageable, that it was impossible to distinguish with any approach to accuracy what the abnormal sounds were.

Obscure Case of Supposed Injury to Brain.—Dr. JOHN ASHHURST, Jr., read the following account of this case:—

Mary G., Irish, aged 40, a widow, was admitted to the Pennsylvania Hospital on Sunday, March 23d, 1862, about 3 P. M.

She was said to have fallen down stairs the evening previous, and had been pronounced by a medical man, who had seen her previous to her being brought to the hospital, to have a fracture of the skull with, it was said at first, symptoms of concussion of the brain, which had however at this time disappeared.

Her condition when admitted was as follows: Her pupils were nearly natural; the left slightly more dilated than the right, but both responding to the stimulus of light. From the left ear was a discharge of what appeared to be bloody serum, small in quantity but constantly accumulating. The mouth was very slightly drawn towards the right side.

Her eyes were kept shut, and she remained continually in a state of profound insensibility, varied with occasional violent and semi-spasmodic motions of both upper and lower extremities. The limbs of the left side were, however, much less thrown about than their fellows. Her pulse and respiration were throughout quite normal.

The left radius was broken obliquely at its lower third. No fracture of the skull was detected.

Her condition did not vary materially from the above during the ensuing night. Her urine was passed involuntarily. While in the state of insensibility above described her limbs remained perfectly rigid, except when thrown about by her half-convulsive movements.

The next morning, Monday, her condition was very much the same. She could now be roused from her lethargy and would articulate a few words before relapsing into the soporose condition. By tickling the soles of her feet the rigidity of her arms would suddenly give way, a phenomenon which gave rise to the suspicion that her condition was epileptic. A sinapism was applied to the nape of the neck, the head shaved, and an evaporating lotion composed of tincture of camphor, alcohol, and ether occasionally made use of.

On Tuesday, March 25th, the paralysis on the left side of the face was very well marked; the tongue, when protruded, inclined slightly to the affected side. There appeared also some paralysis of the entire left half of the body. When addressed she replied in a sharp querulous tone, her sentences interspersed with what almost amounted to shrieks. Her mind was evidently far from being in a normal state.

A microscopic examination of the discharge from the left ear showed the existence of blood corpuscles in abundance, some oil globules, amorphous granules, etc.; without, however, anything resembling pus.

From this time she has gradually improved, and left the hospital last Monday, June 23d, with but a slight distortion of face when speaking, and *bizarrêrie* rather than dulness of mind. I have brought this case before the Society as interesting in connection with the various examples of injuries to the head which I have from time to time reported. The pathological condition in this case I have no doubt is a fracture at the base of the skull involving the petrous portion of the temporal bone. This would account satisfactorily for the various symptoms, and nothing else, so far as I know, could account for the peculiar non-purulent discharge from the ear. What the result in this case will be, it is hard to say; not improbably an

abscess may eventually form in the brain and become the immediate cause of death.

I had last autumn in the hospital a very interesting case of what seemed to be typically concussion of the brain. In this case strabismus and orbital ecchymosis came on subsequently to admission; violent delirium for several days required mechanical restraint; and of the occurrences during this period the patient was totally unconscious when the maniacal paroxysm had passed off. He remained in the house some weeks, at the end of which time the only evidence that he was not well was an occasional foolish remark.

He left the hospital contrary to my advice, and after going about his usual avocations for some days fell down and died. I was not invited to be present at the autopsy, but was told that an abscess of the brain and a fracture of the skull had been found to exist.

Abscess of the brain may result from injuries received long prior to death. Forbes Winslow records cases in which the causes were four, six, and even ten years previous to the fatal issue.

Comminuted Fracture of Skull.—Dr. C. C. LEE presented a specimen of this, and gave its history as follows:—

Hugh R., æt. 53, was admitted into Pennsylvania Hospital June 22, at 1 A. M. Two hours before, while coming down stairs with a child in his arms, he had fallen forward about 10 feet, as was supposed, upon his head. When admitted he was speechless and moaning, but showed some signs of intelligence; the pupils were of normal size but immovable; there was no paralysis or blowing expiration, and the coma was very light; in a word, the case resembled rather concussion than compression of the brain. The scalp was uninjured, but under it was effused a large amount of blood, and although fracture of the skull was feared, it could not accurately be determined. Cold to the head, counter-irritation, and stimulants were employed, but the patient sank slowly and died 16 hours after entering the house. At the autopsy a large quantity of blood was found, as expected, under the scalp, and when this was removed it revealed an extensive radiating fracture, involving the occipital, right and left parietal bones along their lower margins, and the squamous portion of the left temporal bone; on the left side the fracture was comminuted, and a piece of the lower edge of the left parietal bone was considerably depressed; the lines of fracture were confined to the sides and base of the skull; the vertex and orbits were not affected. The membranes were extensively lacerated, and large, diffused clots covered the surface of the right hemisphere and a considerable portion of the left, thus, perhaps, accounting for the absence of marked hemiplegia. The total absence of orbital ecchymosis is also noteworthy, for the fracture extended nearly across the base of the skull.

REVIEWS.

ART. XII.—*A Treatise on the Continued Fevers of Great Britain.* By CHARLES MURCHISON, M. D., Fellow of the Royal College of Physicians, Senior Physician to the London Fever Hospital, &c. &c. &c. London, Parker, Son & Brown, 1862. 8vo. pp. 638.

DR. MURCHISON'S treatise is a valuable contribution to medical literature. Such a work was called for. As the author remarks, notwithstanding the great advance of late years in our knowledge of the continued fevers, no systematic elaborate treatise on these fevers has been published by any English physician for nearly a quarter of a century. We have had in this country the excellent treatise by Bartlett; but important additions to our knowledge have been made since the latter work was written, and, moreover, the periodical fevers and yellow fever being included in Bartlett's treatise, the space devoted to the consideration of continued fevers was necessarily somewhat limited. We are glad that Dr. Murchison has restricted himself to the continued fevers. As a class, these are sufficiently isolated from other fevers to be considered separately, and they form a province of practical medicine sufficiently extensive to require a volume.

The work is divided into eight chapters. Chapter I. is devoted to introductory remarks on the theory of fevers, etc. Chapter II. is occupied with the consideration of typhus. In Chapter III. relapsing fever is considered. Of Chapter IV. the subject is typhoid fever. In the remaining chapters are discussed the specific distinctions of typhus and typhoid fever, the symptoms and varieties of simple continued fever or febricula, the rate of mortality of continued fevers, and the importance of isolating fever patients in hospitals. A copious bibliography, arranged chronologically from 1500 to the present time, forms a valuable appendix to the work.

We do not propose to prepare an analytical review of the work; it would be difficult to do this, inasmuch as the work is not written to set forth any new views, or to advocate any particular doctrines, but to present a comprehensive exposition of our existing knowledge together with the practical conclusions most consistent with this knowledge. Our estimation of the value of the work, based on a careful examination of it, leads us to recommend it most cordially to those who wish to know what is known of the continued fevers; and it would be impossible, were it desirable, within the limits of a review, to give a digest which should serve for the reader as a substitute for a perusal of the work itself. We shall content ourselves with adverting to the author's views on a few of the important questions of which he treats.

The theory of fever which, in the author's opinion, accords with the present extent of our information, is summed up in the following propositions:—

"1. The fever-poison enters the blood.

"2. The nervous system (and particularly the sympathetic and vagus), is paralyzed.

"3. The retrograde metamorphosis of the muscles and other tissues is increased, while, at the same time, little or no fresh material is assimilated to compensate for the loss. Increased temperature, great muscular prostration, and loss of weight are the results.

"4. This destruction of tissue is increased by the accelerated action of the heart.

"5. The non-elimination of the products of tissue-metamorphosis gives rise to cerebral symptoms and local inflammation.

"6. On the elimination of the fever-poison, and of the products of tissue-metamorphosis, the nerves resume their normal functions, the undue consumption of tissue is checked, and the patient regains his strength and weight. It is impossible to say why this termination occurs at a definite time in different fevers."

Assuming that these propositions express correctly the pathology of fever, the objects of treatment are as follows:—

"1. To neutralize the poison and improve the state of the blood.

"2. To promote elimination.

"3. To reduce the temperature and the action of the heart.

"4. To sustain the vital powers by stimulating the paralyzed nervous system, and supplying nourishment to compensate in some measure for the increased consumption of tissue.

"5. To relieve distressing symptoms.

"6. To obviate and counteract local complications."

In treating successively of the three forms of continued fever, the author gives first a succinct historical account of each, next its geographical distribution, and next the etiology. He then takes up the clinical description, and introduces a few illustrative cases. An analysis of the principal symptoms comes next, followed by a consideration of the complications and sequelæ, the varieties, the diagnosis, prognosis, and mortality, the anatomical lesions and the treatment. This arrangement, it will be seen, is comprehensive, and in the several divisions just named, our existing knowledge is concisely, clearly, and fairly presented. The work bears internal evidence of the author's practical familiarity with the continued fevers, and also of his thorough acquaintance with the literature of the subject. As regards the latter, he has not overlooked the contributions of American writers. He accords to Drs. Gerhard and Pennock the credit of priority in the contribution of facts establishing the individuality of typhus.

Of the three continued fevers, the *relapsing fever* will possess comparatively little interest for the American reader. The author states that this fever is not indigenous with us. He is probably correct in this statement. Aside from five cases reported by Dr. A. Dubois as cases of typhus followed by a severe form of inflammation of the eye,[1] and fifteen cases reported by the writer of this article[2] (to which reference is made by the author), we are not aware of any reports of cases observed on this side of the Atlantic. Dr. Dubois' cases occurred in 1847–48, and our cases in 1850–51. The latter cases were all among immigrants from Ireland; but in six cases the patients had been in this country for a period varying from six months to five years. It is hardly probable that, in the latter cases, the disease was imported by the patients. In Dr. Dubois' report the facts respecting the time of residence in this country are not stated. It may be that this form of fever is occasionally produced here, but is confounded with typhus or typhoid and perhaps with remitting fever. We believe that it is not doing

[1] Trans. Am. Med. Association, vol. i., 1848.

[2] Clinical Reports on Continued Fever, p. 365.

injustice to our brethren to say that very little attention has, as yet, been given in this country, to the subject of relapsing fever, so that it would not be very remarkable if cases are not recognized as such. This was true of the cases observed by Dr. Dubois, and by us at the time the cases were under observation. It is desirable that practitioners in this country should be aware of the traits which distinguish relapsing fever, so as to be prepared to recognize examples of it should they occur, and we therefore quote the summary which the author embodies in his definition, as follows:—

"A very abrupt invasion marked by rigors or chilliness; quick, full, and often bounding pulse; white moist tongue, sometimes becoming dry and brownish; tenderness at the epigastrium; vomiting and often jaundice; enlarged liver and spleen; constipation; skin very hot and dry; no characteristic eruption; high coloured urine; severe headache, and pains in the back and limbs; restlessness and occasionally acute delirium; an abrupt cessation of all these symptoms with free perspiration about the fifth or seventh day, after a complete apyretic interval during which the patient may get up and walk about, a short relapse on the fourteenth day from the first commencement running a similar course to the first attack, and terminating on or about the third day of the relapse; sometimes a second, and even a fifth relapse; mortality small, but occasionally death from sudden syncope, or from suppression of urine and coma. After death, no specific lesion, but usually enlargement of the liver and spleen."

Whether this form of fever be a distinct species, or only a variety of the other forms of continued fever, is a question which probably all will not consider as yet positively settled. And assuming it to be a distinct species, there are certain points which require further investigation; for example, as to its contagiousness. Dr. Murchison following Dr. Jenner and others, regards it as contagious. He attributes its prevalence as an epidemic to scarcity and famine; indeed, he calls it relapsing or famine fever. Deprivation of food certainly did not enter into the causation in the cases observed by us. We cannot, however, enter into a discussion of these and other points of interest.

Typhoid fever the author proposes to call *pythogenic*, a name which denotes its supposed source to be putrescent organic matter. This title seems to us objectionable. It is based on a view of its causation which must be considered as problematical; and, certainly, the disease does not spring from a putrescent source when it is communicated by contagion. We agree with the author in his objection to the term *enteric fever*, on the ground that it conveys the erroneous impression that the fever is the result of the intestinal lesion. On the whole, the much abused name *typhoid* seems to us, in the existing state of our knowledge, to be as good as any which can be suggested, and we opine that the disease will continue to be known by this name in spite of attempts to substitute another cognomen.

Dr. Murchison holds to the non-identity of typhus and typhoid fever. He began his clinical studies with the belief in their identity, adopting the opinion of his teachers; but bed-side observation led him to the conclusion that these two forms of fever are essentially distinct, that they are two diseases, each having its own special course. Are we not at length, in view of all the facts which clinical research has developed, warranted in considering this much mooted question fully settled? Is there any occasion for protracting the discussion? We can see no other ground for the affirmative to the latter question than that a few are still unwilling to abandon views to which they are committed. If the evidence of the non-identity of typhus and typhoid fever be not complete, we are warranted in disinterring

the question as to the identity of measles and scarlet fever, which has scarcely been buried half a century. Dr. Murchison does not present any new facts bearing on the non-identity of typhus and typhoid fever, but he states the evidence justly and fairly, derived from the lesions found after death, a comparison of the phenomena during life, the existence of distinct poisons producing the two diseases etc. We commend this part of the work to those who have formed an opinion without a knowledge of all the facts bearing on this matter.

An interesting question which claims investigation is, whether the two diseases may not sometimes coexist. Dr. M. reports three cases in which they appeared to be combined. We know that the eruptive fevers may be blended, and this, we are persuaded, is true of remitting and typhoid fever. *A priori* there is no incongruity in the supposition, but further clinical observation with reference to this point is desirable.

There is no more room for doubting the occasional contagiousness of typhoid fever than its being a distinct species. The author adduces ample evidence of its communicability, but in none of the instances cited is the proof so conclusive as in the epidemic which came under our observation in 1843, an account of which was published in the *American Journal of the Medical Sciences* in July, 1845.[1] The combination of circumstances in that epidemic was so remarkable, as bearing on the question of contagiousness, that we are led here to reproduce the important facts for the sake of directing the attention of those of our readers who may be interested in this still mooted question, to the more detailed account.

A small isolated settlement known as North Boston, in the western part of New York, consisted in the autumn of 1843, of nine families and forty-three persons. The settlement embraced an inn and a group of houses within an area of ten rods. Two houses were situated at a distance of forty rods from the inn, and one of those houses was separated by a small stream. A young man from Massachusetts, travelling in the stage coach, had been ill for several days, and, at length, on the coach arriving at this settlement, was unable to proceed, and was left at the inn. Prior to this occurrence the settlement was healthy, and typhoid fever was unknown in that part of the State. The prevailing fever was intermitting and remitting. The stranger lingered twenty-nine days and died. He was seen by several physicians, and from their account of the symptoms the disease was undoubtedly typhoid fever. Twenty-three days after the arrival of the stranger, two members of the family of the inn-keeper were attacked, and subsequently five others in this family. In all the other families situated within ten rods of the inn, excepting a single family, cases occurred more or less in number, within a month from the date of the first case after the stranger arrived; and during this period more than half the population of the settlement were affected. The disease then ceased further progress, no cases afterward occurring. The disease was shown to be typhoid fever by the symptoms in several of the cases which were recorded by the bed-side, and by the characteristic intestinal lesions in the autopsy of a fatal case. The family in which no cases occurred was the only family, of the seven families residing within a few rods of the inn, the members of which were not brought into close contact with the disease. This family were on terms of non-intercourse with the inn-keeper and with the other families who were tenants and dependants of the

[1] See, also, a fuller account in Clinical Reports on continued fever by the writer of this article.

inn-keeper. None of the members of this family saw any patient affected with the disease. And in consequence of the exemption of this family and the feeling of animosity in the minds of the inn-keeper and others, it was supposed that the common well had been poisoned. This suspicion was strengthened by the fact that the family referred to had been denied access to the well, which was used in common. All these facts were ascertained by a personal investigation on the spot by the writer. The water from the well was examined by competent chemists and found to be remarkably pure. Now, in view of the facts just stated, if it be contended that the disease was not transported to this settlement and diffused by contagion, it is necessary to admit a series of coincidences almost incredible. The circumstances embrace everything which could be desired for a fair experiment in order to test the contagiousness of a disease. In fact if every circumstance had been deliberately selected and arranged for an experiment of that kind, they could hardly have been more complete.

Dr. Murchison's views of the treatment of typhus and typhoid fever seem to us, in the main, to be sound and judicious. We agree with him in thinking that there is a tendency at present to a too indiscriminate and excessive use of alcoholic stimulants. The rules which he lays down with respect to this important part of the treatment, are consistent alike with proper prudence and a due sense of its importance. He regards tea and coffee as highly useful, acting as nervous stimulants and retarding the waste of the tissues. With respect to the efficiency of the mineral acids, he does not join in the rather extravagant statements of Huss and Chambers; but, after a trial of them in many hundred cases, he believes them to be of much value. He prefers a combination of the hydrochloric and sulphuric. An injunction with respect to the administration of food is, we suspect, not less called for than judicious. It is that food should not be given at shorter intervals than two hours. We are sure that it is too often the practice in this country, as well as in Europe, to push the frequent administration of food to an extreme, leaving the patient scarcely any period for repose.

With these few references we take leave of the work as a reviewer, but not as a reader. It is a work not only to be read but often referred to. It is a great deal to say of such a work that it comprises nearly all of our existing knowledge which is of practical importance to the medical practitioner; but we believe that this may justly be said of Dr. Murchison's treatise.

A. F.

ART. XIII.—*On the Characters of Inorganic and Organic Matter.*

1. *Société Chimique de Paris. Leçons de Chimie professées en* 1860. Par MM. PASTEUR, CAHOURS, WURTZ, BERTHELOT, SAINTE-CLAIRE DEVILLE, BARRAL et DUMAS. Sujets des Leçons: *Recherches sur la Dissymétrie moléculaire des Produits organiques naturels.* Par M. L. PASTEUR; *Histoire des Radicaux organiques.* Par M. AUGUSTE CAHOURS; *Histoire générale des Glycols.* Par M. ADOLPHE WURTZ; *De la Synthèse en Chimie organique.* Par M. BERTHELOT; *Des Lois de Nombres en Chimie et de la Variation de leurs Constantes.* Par M. H. SAINTE-CLAIRE DEVILLE; *De L'Influence exercée par l'Atmosphère sur la Végétation.* Par M. J. A. BARRAL; *Deux Pièces Historiques concernant les Opinions de Lavoisier au sujet de la Formation des Êtres organisés et celles de N. Le Blanc au sujet de la Théorie des Engrais, recueillies* par M. DUMAS. Librairie de L. HACHETTE et Cie. Paris, 1861. 8vo. pp. 307.
2. *The Principles of Biology.* Part 1. *The Data of Biology.* By HERBERT SPENCER. Williams and Norgate: London, 1863. 8vo. pp. 80.
3. *The Unity of Matter. A Dialogue on the Relation between the various Forms of Matter which affect the Senses.* By ALEX. STEPHEN WILSON. Samuel Highley: London, 1855. 8vo. pp. 79.
4. *On Matter and Ether, or the Secret Laws of Physical Change.* By THOMAS RAWSON BIRKS, M. A., Rector of Kelshall, Herts; formerly Fellow of Trinity College, Cambridge. Macmillan & Co.: Cambridge and London, 1862. 8vo. pp. 216.
5. *Sur la Substance organisée et l'État d'Organisation.* Par DR. CHARLES ROBIN, Professeur d'Histologie à la Faculté de Médecine de Paris. Journal de la Physiologie de l'Homme et des Animaux. T. 5ème, Numero XX., 1èr fascicule. Victor Masson et Fils: Paris, 1862.

IF any one discovery more strongly characterizes modern science than another, it is that made by the chemist in relation to the elementary composition of natural objects. Upon the researches of Lavoisier, Thenard, Gay Lussac, Berzelius, Prout, Thompson, Saussure, Berard, Chevreul, Ure and many others, rests, in great part, one of the grandest conceptions of science—the substantive or compositional unity of creation. Everywhere in the innumerable forms of things by which we are surrounded, and the perpetually varying phenomena which they exhibit, we encounter the same material elements. These elements are eminently elective and protean. The animal differs from the vegetable, and both in turn from the mineral, the metal and the earth. These latter constitute the common matter of the globe; from this matter the former spring and to it they return again.

The natural philosopher, confounded by the number and variety of the objects presented for his consideration, has resolved to divide them, for their more convenient and efficient study, into two great classes—animate and inanimate, organic and inorganic. The classification or arrangement into kindred groups, thus inaugurated, has been still more minutely employed in each division, with the ultimate object of assigning to each body its definite position in the graduated scale of nature.

An accurate knowledge of the statical and dynamical relations existing between these two great divisions of matter, constitutes the corner stone of the stately edifice of biological science.

"In entering upon the study of Physiology," writes Müller, "the first point to be ascertained regards the distinctions between these two great classes of bodies—the organic and the inorganic—and the following questions suggest themselves for discussion: Do organic and inorganic substances differ in their material composition? and if the phenomena presented by them are obviously different, are the forces or principles on which these phenomena depend, also different; or are the forces which give rise to the phenomena of the organic kingdom merely modifications of those which produce physical and chemical actions?"[1]

Physiologists are not wanting who maintain without hesitation that such inquiries are superfluous and wholly irrelevant to the study of the complicated course of life in man and animals.[2] But the prosperity and success of biological science, as a philosophical study, obviously depend upon the determination of these very questions. Only by their determination can the relations of biology with other sciences be settled. Duges and others may ignore the discussion, but we cannot fail to perceive that the study of the differential characters of organic and inorganic bodies is, as Longet has well said, in the introduction to his elaborate "*Traité de Physiologie*"—the study of life by elimination.[3]

Now since the days of Vicq d'Azyr[4] it has been customary to distinguish organic from inorganic bodies by saying, among other things, that the former always originate from parents like themselves, grow by internal deposit, and assume, in the course of development, a rounded and constant form and a determinate size; while the latter spring from no parents, enlarge by simple accretion, and exhibit an angular and variable form and an indefinite size; that the former are heterogeneous in their composition or composed of dissimilar particles, while the latter are homogeneous or made up of particles each like the other; that the consistence of the first is characterized by softness and elasticity, of the second by hardness and solidity; that the organic body has a fixed duration of life, while the inorganic retains its individuality for an indefinite period; that the "character of an inorganic substance is to be found in the properties of its integral particles," while the "living body derives its character from the whole mass, from the assemblage of all the parts"—this character, which is more simple or complicated according to the place which the body occupies in the scale of being, differing altogether from that of its component particles." The two groups have been contrasted in point of chemical composition also. The inorganic substance is occasionally simple or elementary, is rarely composed of more than three elements, is constant in composition, can be decomposed and recomposed at will, and exhibits, when left to itself, no tendency to decomposition. The organic body, on the other hand, is said to be never simple or elementary, to consist of at least three or four elements, to be variable in composition, to be readily decomposed, but not recomposed, and to exhibit a marked tendency to decomposition.

Berzelius, Fourcroy, De Blainville, Müller and others maintained, and upon their authority the proposition was long received as true, that the binary method of combination prevails among inorganic, and the ternary or quaternary among organic bodies. Müller particularly embraced and taught this

[1] Elements of Physiology. Philada., 1843, p. 13.

[2] Duges. Physiologie Comparée. Paris, 1838, t. i. p. 4.

[3] "Étudier ces caractères, c'est entrer dans l'étude de la vie par l'élimination de ce qui n'en fait pas partie."

[4] Encyclopedie méthodique. Système anatomique. Quadrupédes par F. Vicq d'Azyr. Second discours préliminaire sur l'anatomie simple et comparée. Paris, 1792, 4to. p. iii.

view, which has since become untenable in consequence of the discovery of the radicals, and which Mulder emphatically criticized as "durchaus unchemisch," or entirely un-chemical. "If any distinction is to be made between organized and unorganized chemical substances," says this eminent chemist, "it should be stated thus: that in the former, compound radicals exist; and in the latter, elementary ones."[1]

Lewes lays down as a capital distinction between organic and inorganic substances these primary static laws:—

"I. The elements which compose organic substances are the same as those which compose inorganic substances; but in the organic they occur as higher multiples, in other words the organic molecule is a greater multiple of forces than the inorganic molecule.

"II. The presence of these higher multiples is accompanied by an indefinite composition in lieu of a definite composition, and by a characteristic immediate synthesis of the elements."[2]

For a novel and deeply interesting discourse upon a fundamental physical distinction between the organic and inorganic body, we are indebted to M. Pasteur, the distinguished French chemist, whose recent brilliant experiments in another field of scientific inquiry have resulted in giving the *coup de grâce* to the doctrine of spontaneous generation. This discourse, the title of which will be found at the head of this article, was delivered before the Chemical Society of Paris in the winter of 1860. We ask the attention of our readers to the following brief analysis of the facts and arguments contained therein.

At the close of the year 1808 Malus announced that the light reflected by all opaque or diaphanous bodies acquired new and very extraordinary properties, which distinguished it essentially from the light emitted directly from luminous objects. This modification, which light undergoes during reflection, was called by Malus polarization.

It has long been known that a direct ray of light in passing through a rhomboidal crystal of carbonate of lime is uniformly divided into two white bundles of the same intensity. The flame of a candle seen through such a rhomb is always double, and the two images are equally brilliant. Malus demonstrated that the modification impressed upon light by the double refraction was identical with that produced by reflection from the surface of opaque or diaphanous bodies; or in other words, that the ordinary and extraordinary rays produced by a doubly refracting crystal are polarized rays.

In 1811 Arago discovered that if, by the aid of a rhomboidal crystal of Iceland Spar, we analyze a polarized ray of light as it issues from a section of rock crystal cut perpendicularly to its axis, two images are constantly seen in all the positions of the rhomboid, and these two images are colored, moreover, with complementary tints.

More recently Biot polarized successively each of the simple rays of the spectrum, and found that the primitive plane of polarization was made to deviate at an angle proportional to the thickness of the section, and that this angle differs for each simple color, increasing with the refrangibility according to a definite law. Biot also made the curious observation that in some crystals of quartz the plane of polarization revolves from right to left, and

[1] The Chemistry of Vegetable and Animal Physiology. Edinburgh and London, 1849, p. 89.

[2] Comte's Philosophy of the Sciences, London, 1853, pp. 145, 152.

in others from left to right, although the crystals themselves differ apparently only by a very slight, almost imperceptible, variety in form. The rotation to the right is accomplished according to the same laws and with the same energy as that to the left.

In the Bulletin of the *Société philomatique* for December, 1815, Biot announced that the same properties were possessed by a variety of natural organic products. Oil of turpentine and an essential oil of laurel cause the plane of polarization to turn to the left, whereas, the syrup of sugar cane and an alcoholic solution of camphor turn it to the right. A compensation is effected by the superposition or mixture of two liquids which possess these opposite properties, provided no chemical action takes place. A remarkable difference was also observed by M. Biot between the action of the particles of the same substance when in a liquid or solid state. The syrup of grapes, for example, turns the plane of polarization to the left as long as it remains liquid; but as soon as it acquires the solid form of sugar, it causes the plane of polarization to revolve toward the right, a property which it retains even when again dissolved. Instances occur also in which these circumstances are reversed. A ray of light passing through a liquid possessing the power of circular polarization is not affected by mixing other fluids with the liquid—such as water, ether, alcohol, &c.—which do not possess circular polarization themselves, the angle of deviation remaining exactly the same as before the mixture. Whence M. Biot infers that the action exercised by the liquids in question does not depend upon their mass, but that it is a molecular action exercised by the ultimate particles of matter, which depend solely upon the individual constitution, and is entirely independent of the positions and mutual distances of the particles with regard to each other. These important discoveries show, that circular polarization surpasses the power of chemical analysis in giving certain and direct evidence of the similarity or difference existing in the molecular constitution of bodies, as well as of the permanency of that constitution, or of the fluctuations to which it may be liable. For example, no chemical difference has been discovered between syrup from the sugar cane and syrup from grapes. Yet the first causes the plane of polarization to revolve to the right, and the other to the left; therefore, some essential difference must exist in the nature of their ultimate molecules. The same difference is to be traced between the juices of such plants as give sugar similar to that from the cane, and those which yield sugar like that from the grape.

It is a fact established by Biot, that in circular polarization, the laws of rotation followed by the different simple rays of light are dissimilar in different substances. Whence he infers that the deviation of the simple rays from one another ought not to result from a special property of the luminous principle only, but that the proper action of the molecules must also concur in modifying the deviations of the simple rays differently in different substances.[1]

In this connection, and for the better understanding of what follows, M. Pasteur calls attention particularly to the rotatory property in tartaric acid, and its absence in paratartaric or racemic acid, which is isomeric with tartaric acid.

These physical facts being thus briefly posited, the reader is next reminded of certain mineralogical truths bearing upon this subject.

Haüy and Weiss pointed out that in quartz there exist hemihedral sur-

[1] Somerville's Connection of the Physical Sciences.

faces or planes which in some specimens incline to the right, and in others to the left. In respect to their optical properties Biot found that crystals of quartz arrange themselves into two groups, one of which turns the plane of polarized light to the right, and the other to the left. In his turn, Herschell showed that in these *plagihedral* crystals, as they are called, the direction of rotation is either to the right or left, according to the inclination of their unsymmetrical faces. In cases where no such faces can be traced, the rotative power is generally absent; and this arises, as is remarkably evident in amethyst, from the crystal being formed of separate crystals rolled up together; and as these may possess opposite rotation, and so neutralize each other, the action on light should be like that of calcareous spar, which has no rotative power.

"With such an example," writes Prof. Kane, "it was not difficult to conclude that the power of rotation depended upon the crystalline arrangement, particularly as quartz, in all its uncrystallized conditions, is devoid of all rotative power; and, accordingly, until the discovery of the power of rotation in liquids, and that this property was found to accompany the molecules of the body through all states of aggregation, it was considered to have its origin in the mechanical structure of the body; but we must now invert the argument, and infer that the difference of rotative power in right-handed and left-handed quartz does not result from the difference of crystalline arrangement, but that this last is caused by actual difference of properties in the molecules themselves, of which the most remarkable is detected by the opposite actions on light."[1]

M. Pasteur shows that all the tartrates are plagihedral, and he concludes that, as in the case of quartz, there is a correlation between hemihedry and circular polarization. Additional examples of this correlation are found among the numerous crystallizable organic products, which possess the molecular, rotatory property, and exhibit hemihedral, crystalline forms. Paratartaric acid and its salts, substances isomeric with the tartaric compounds, do not show any hemihedral tendency, and, as Biot has demonstrated, they exert no influence upon polarized light.

With these facts before him, the correspondence of hemihedry and the molecular, rotatory power of natural, organic products gradually assumed more and more importance in the mind of Pasteur. The following remarkable note of Mitscherlich, communicated to the Academy of Sciences by Biot, appeared to him to be so difficult of acceptance, as a matter-of-fact statement, that he was led to test its accuracy, or rather that of the concluding observation, by a most careful investigation into the crystallography of the tartrates and paratartrates:—

"The double tartrate and paratartrate of soda and ammonia," says Mitscherlich, "have the same chemical composition, the same crystalline form, with the same angles, the same specific gravity, the same double refraction, and consequently the same angle of optical axes. Dissolved in water their refraction is the same. But the tartrate in solution turns the plane of polarized light; the paratartrate does not. Now in these two bodies," continues Mitscherlich, "the nature and number of atoms, and their arrangement and distances are the same."

Pasteur found that the double tartrate of soda and ammonia was hemihedral, like all the other tartrates which he had previously studied, but, singularly enough, the paratartrate was equally hemihedral, with this peculiarity, that the hemihedral faces, which in the tartrate were all on the same side, inclined, in the paratartrate, sometimes to the right and sometimes to the left. Astonished at this result, he separated the right-handed

[1] Elements of Chemistry.

and left-handed crystals into two groups, and observed separately their solutions in the apparatus of polarization. He then saw that the plane of polarization was turned to the right by the right-handed hemihedral crystals, and to the left by the left-handed crystals. When equal weights of these two salts were dissolved together the mixture was neutral for light, in consequence of the two deviations being equal and on opposite sides.

Pasteur's investigations upon the double paratartrate of soda and ammonia show that there are two symmetrically, isomorphous, atomical groups intimately united in paratartaric acid. From a solution of the double paratartrate, crystals are deposited which have exactly the same angles, the same aspect, &c., to such a degree that M. Mitscherlich, after the most minute study of their form, could point out no difference between them. Nevertheless they affect a ray of polarized light differently, and it is easy to prove that these two species of crystals represent two distinct groups from which we can obtain two distinct acids. The one which is derived from the right hemihedral salt turns the plane of polarization to the right, and is identical with the ordinary tartaric acid. The other, like the salt which furnishes it, turns the ray to the left. Relatively to their chemical and crystallographic properties, all that can be done with one of the acids may be repeated with the other under the same conditions; and in both cases we obtain products identical but not superposable, products which resemble each other as the right hand does the left. They exhibit the same forms, the same surfaces, the same angles, and are hemihedral in both cases. The only difference is in the inclination of the hemihedral facettes, and in the direction of the rotatory power.

Let us recall here the definition of a chemical species as laid down by Chevreul in 1823: "*Dans les corps composés*," said he, "*l'espèce est une collection d'êtres identiques par la nature, la proportion et l'arrangement des éléments.*" All the properties of bodies are functions of these three terms, and the object of the philosophical chemist is to arrive at an acquaintance with these three physical characters, through our knowledge of properties.

The study of isomerism and isomorphism enables us to establish a connection between the chemical and physical properties of bodies on the one hand, and the molecular arrangement which determines these, on the other. In other words, we are thus enabled to ascend from the properties of bodies to their ultimate atomic cause.

From studies of this nature Pasteur concludes that, 1st, when the elementary atoms of organic products are grouped unsymmetrically, the crystalline form of the body manifests this molecular dissymmetry by non-superposable hemihedry. Here then we may detect the cause of the hemihedral character of certain crystals. 2d. The existence of this same molecular symmetry shows itself by rotatory, optical properties. The cause of rotatory polarization thus becomes manifest.

If we attentively consider all material objects, whatever they may be in respect to their forms, and the repetition of their identical parts, we find that they are divisible into two great classes—those with superposable and those with non-superposable images. All the artificial products of the laboratory and all mineral bodies have superposable images. On the contrary most of the natural, organic products, and all the essential products of life are unsymmetrical, and this want of symmetry prevents their image from being superposable.

In order to elucidate this difference Pasteur thus compares together the

structure of quartz and that of natural organic products. Imagine, he says, a winding staircase, the steps of which are cubes or any other object with superposable image. Destroy the staircase and the dissymmetry will have disappeared, inasmuch as the want of symmetry of the staircase was merely the result of the manner in which the steps were arranged. Such is quartz. The crystal of quartz is the staircase all entire. It is hemihedral, and, in consequence, influences polarized light. If we dissolve the crystal or destroy its physical structure in any manner whatever, its non-symmetrical character is suppressed, and with it all action on polarized light. Imagine, on the contrary, the same winding staircase composed of irregular tetrahedra for steps. Destroy the staircase and the non-symmetry still remains, because each component tetrahedra is a non-symmetrical body proper, no matter in what position it is placed. Such are the organic bodies where all the molecules have a dissymmetry peculiar to themselves and expressing itself in the form of the crystal. When the crystal is dissolved the liquid still influences polarized light, because it is formed of molecules, mixed together confusedly, it is true, but each one being non-symmetrical in the same direction, if not to the same extent.

Quartz is therefore not molecularly dissymmetrical, nor have we any example of a mineral possessed of molecular dissymmetry. This statement is true also of the artificial compounds of the laboratory.

All the substances most essential in the animal and vegetable organisms, such as cellulose, fecula, gum, sugar, tartaric, malic, quinic and tannic acids, morphia, codeia, quinia, strychnia, brucia, albumen, fibrin, gelatine, &c., are molecularly dissymmetrical. They have the power of rotating light, a feature necessary and of itself sufficient to establish asymmetry in the absence of the hemihedral character.

A body may possess right-handed or left-handed dissymmetry. In consequence of certain peculiarities of isomeric transformation, which it is necessary to discover for each case, it may lose its molecular dissymmetry, untwist itself, so to speak, and effect in the arrangement of its atoms a symmetrical form. By the action of heat a right-handed body may be turned into a left, and inversely. Thus by heating right tartaric acid it is transformed into left tartaric acid, or rather paratartaric acid. Molecular dissymmetry powerfully modifies chemical affinity and influences the characteristic properties of bodies.

Pasteur thinks that a dissymmetrical force is present and in action at the moment of the elaboration of the immediate principles in the vegetable organism.

"I regard," he writes, "as a necessary conclusion the existence of dissymmetrical forces at the moment of the elaboration of natural organic products—forces which are absent or without effect in the reactions of our laboratories, either on account of the abrupt action of these phenomena, or from some unknown circumstance."

Whether these forces reside in light, electricity, magnetism or heat; whether they are related to the motion of the earth, or to the electrical currents by which physicists explain the terrestrial magnetic poles, he thinks it impossible to offer at present any conjecture.

The researches of Pasteur show that molecular dissymmetry modifies the active phenomena of life as well as the chemical affinity exhibited by inorganic matter. Of this we have an interesting proof in the phenomena of fermentation. If we dissolve some right-handed crystals of the pure tartrate of ammonia and add to the solution a small quantity of some albu-

minoid substance, in the proportion of 1 grain of the dried albuminoid matter to 100 grains of the tartrate, and place the mixture in an oven, fermentation will take place spontaneously. If we treat the paratartrate of ammonia in the same manner, it also ferments. If, however, we observe the two processes, by means of the apparatus of polarization, we soon discover profound differences between them. The liquid, originally inactive, acquires a rotatory power to the left, which augments by degrees and attains a maximum, when the fermentation is suspended. There is no longer a trace of the right acid in the liquid, which, evaporated and mixed with its volume of alcohol, furnishes immediately a beautiful crystallization of left-handed tartrate of ammonia.

In this phenomenon, as in all cases of fermentation properly so called, there is a substance chemically transformed, and at the same time the ferment itself is increased in quantity. In this particular case, however, and this is worthy of note, the ferment which actively influences the right handed salt, respects the left, notwithstanding that the two salts, as long as they are not submitted to dissymmetrical actions, are absolutely identical in chemical and physical properties.

Here, then, we see the molecular dissymmetry peculiar to organic matters, intervening in a physiological phenomenon, in such a marked manner as to demand for its influence in all our biological studies, the most attentive consideration, especially as it claims to constitute the only trenchant line of demarcation between the chemistry of inanimate and that of living nature.

Upon some of these physical and chemical distinctions, various scholastic definitions of organized and inorganic bodies have been based and published from time to time, as exact interpretations of nature's method. But neither these distinctions nor the apparently reliable formulæ growing out of them, are able to stand the test of rigid examination.[1]

[1] Such formulæ require modification from time to time, as new views of the intimate nature of matter arise. Thus in 1849, Dr. Chas. Robin attempted a definition of organized beings in the following language:—

"Corps de volume et de forme déterminés, quoique très divers, limités par des surfaces courbes; présentant un ensemble de caractères physiques qui résultent de la disposition des éléments anatomiques dont ils sont formés, et qui, bien que variables de l'un à l'autre, n'appartiennent pourtant qu'à eux; composés de principes immédiats gazeux, liquides et solides, dus à des combinaisons complexes et peu stables d'un petit nombre de substances simples."—*De la classification des Sciences fondamentales en général, de la Biologie et de l'Anatomie en particulier.* Paris, 1849, p. 117.

In the October number (1862) of Dr. Brown-Séquard's *Journal de la Physiologie*, which has just reached us, we find a highly philosophical memoir upon "Organized Substances," contributed by Dr. Robin. In this memoir the following paragraph occurs:—

"Un *corps organisé* est; tout corps solide, demi-solide ou liquide provenant d'un être qui a ou qui a eu éxistence séparée, composé de principes immédiats nombreux et complexes, appartenant à trois groupes ou classes distincts, et unis molécule à molécule par dissolution réciproque et combinaison spéciale. Que ce corps forme un tout indépendant ou une partie d'un tout, ce n'est pas moins un *corps organisé*, et l'être complexe d'ou proviennent les parties est, à plus forte raison, un *corps organisé*."

The first definition, it will be observed, involves the fundamental idea of the attribution of the characteristic properties of organized bodies to a peculiar arrangement of their constituent anatomical elements. In the second the essential feature is the union of the immediate principles molecule by molecule.

A steadily progressive chemical science is day after day more and more positively showing us that the difference manifested to the unaided senses by the various natural bodies constituting the universe, is a difference of degree rather than of kind, of combination rather than of diversity. In organized matter no element is found which does not exist in the inorganic world, and if we are to accept the theories of combination advanced by Graham and Daniell—theories based upon certain electrical decompositions—even the methods of combination in the two kingdoms are perfectly analogous.

The distinctions in truth, between the organic and inorganic worlds, as ordinarily laid down by physiologists, are more specious than real. Such distinctions, like many of those recognized by naturalists in their systematic classifications, result rather from the refining and subtilizing tendencies of the human mind, than from any inherent differences in nature.

Between the organic and inorganic body there are undoubtedly dynamic differences. But these differences, the conditions being the same, necessarily presuppose others of a statical character. As the very first step, therefore, towards determining the nature and extent of such differences, and estimating their true value in biological science, we must acquaint ourselves with all the details of the dynamical and statical characters of organic matter. Those of inorganic matter have been quite fully, though not entirely, ascertained.

In the first chapter of his *Principles of Biology*, Herbert Spencer, with a highly philosophical conception of the nature of his subject, addresses himself to the discussion, not of the points in which organic and inorganic bodies differ, but of the characteristic features of organic matter. These features are briefly as follows:—

Organic bodies are made up chiefly of the four essential elements, oxygen, hydrogen, nitrogen and carbon, three of which are gaseous, are known in the aeriform state only, and have hitherto defied all attempts to reduce them to the liquid condition, even under the greatest pressures.

"Considering them chemically instead of physically, it is to be remarked that three out of these four main components of organic matter, have affinities which are narrow in their range and low in their intensity. * * * * * *

"Among the organic elements, including under the title not only the four chief ones, but also the less conspicuous remainder, that capability of assuming different states called allotropism, is frequent. * * * *

"Allotropism being interpretable as some change of molecular arrangement, this frequency of its occurrence among the components of organic matter, is significant as implying a further kind of molecular mobility.

"One more fact, that is here of great interest for us, must be set down. These four elements of which organisms are almost wholly composed, present us with certain extreme antitheses. While between two of them we have an unsurpassed contrast in chemical activity, between one of them and the other three, we have an unsurpassed contrast in molecular mobility. While carbon, by successfully resisting fusion and volatilization at the highest temperatures that can be produced, shows us a degree of atomic cohesion greater than that of any other known element; hydrogen, oxygen and nitrogen show the least atomic cohesion of all elements. And while oxygen displays, alike in the range and intensity of its affinities, a chemical energy exceeding that of any other substance (unless fluorine be considered an exception), nitrogen displays the greatest chemical inactivity. Now, on calling to mind one of the general truths arrived at when analyzing the process of evolution, the probable significance of this double difference will be seen. It was shown (*First Principles*, § 123) that, other things equal, unlike units are more easily separated by incident forces than like units are; that an incident force falling on units that are but little dissimi-

lar does not readily segregate them; but that it readily segregates them if they are widely dissimilar. Thus, these two extreme contrasts, the one between physical mobilities, and the other between chemical activities, fulfil, in the highest degree, a certain further condition to facility of differentiation and integration.

"Among the binary combination of these four chief organic elements, we find a molecular mobility much less than that of these elements themselves; at the same time that it is much greater than that of binary compounds in general. * *

"Considering them chemically it is to be remarked of these binary compounds of the four chief organic elements, that they are, on the average, less stable than binary compounds in general. Water, carbonic oxide, and carbonic acid, are, it is true, difficult to decompose. But omitting these, the usual strength of union among the elements of the above named substances is low considering the simplicity of the substances. * * * * * *

"Here it will be well to note, as having a bearing upon what is to follow, how characteristic of most nitrogenous compounds is this special instability. In all the familiar cases of sudden and violent decomposition, the change is due to the presence of nitrogen. * * * * * * When we come hereafter to observe the part which nitrogen plays in organic actions, we shall see the significance of this extreme readiness shown by its compounds to undergo change. * * * *

"These binary compounds, like their elements, are to a considerable degree characterized by the prevalence among them of allotropism; or, as it is more usually called when displayed by compound bodies, isomerism.

"There is one further fact respecting these binary compounds of the four chief organic elements, which must not be overlooked. Those of them which form parts of the living tissues of plants and animals (excluding water, which has a mechanical function, and carbonic acid, which is a product of decomposition) are confined to one group—the hydro-carbons. And of this group, which is on the average characterized by comparative instability and inertness, these hydro-carbons found in living tissues, are among the most unstable and inert.

"Passing now to the substances which contain three of these chief organic elements, we have first to note that along with the greater atomic weight which mostly accompanies their increased complexity, there is, on the average, a further marked decrease of molecular mobility.

"In chemical stability these ternary compounds, considered as a group, are in a marked degree below the binary ones. As a class they are chemically inactive and the phenomena of isomerism and polymerism are of frequent occurrence among them. * * * * *

"It is, however, the nitrogenous constituents of living tissues that display most markedly those characteristics of which we have been tracing the growth. Albumen, fibrin, casein, and their allies, are bodies in which that molecular mobility exhibited by three of their components in so high a degree, is reduced to a minimum. The chemical characteristics of these substances are instability and inertness carried to the extreme. * * *

"It should be noted, too, of these bodies that, though they exhibit in the lowest degree that kind of molecular mobility which implies facile vibration of the atoms as wholes, they exhibit in a high degree that kind of molecular mobility resulting in isomerism, which implies permanent changes in the positions of adjacent atoms with respect to each other. Each of them has a soluble and insoluble form. In some cases there are indications of more than two such forms. And it appears that their metamorphoses take place under very slight changes of conditions.

"In these most unstable and inert organic compounds, we find that the atomic complexity reaches a maximum; not only since the four chief organic elements are here united with small proportions of sulphur and phosphorus, but also since they are united in high multiples. The peculiarity which we found characterized even binary compounds of the organic elements, that their atoms are formed not of single equivalents of each component, but of two, three, four, and more equivalents, is carried to the greatest extreme in those compounds that take the leading part in organic actions. * * * * *

"Applying to atoms the mechanical law which holds of masses, that since

inertia and gravity increase as the cubes of the dimension while cohesion increases as their squares, the self-sustaining power of a body becomes relatively smaller as its bulk becomes greater; it might be argued that these large aggregate atoms which constitute organic substance are mechanically weak—are less able than simpler atoms to bear, without alteration, the forces falling on them. That very massiveness which renders them less mobile, enables the physical forces acting on them more readily to change the relative positions of their component atoms, and so to produce what we know as re-arrangements and decompositions. * * * *

"Professor Graham has recently published a series of important researches, which promise to throw much light on the constitution and changes of organic matter. He shows that solid substances exist under two forms of aggregation —the colloid or jelly-like, and the crystalloid or crystal-like. The colloid is a dynamical state of matter, the crystalloidal being the statical condition. The colloid possesses *energia*. It may be looked upon as the primary source of the force appearing in the phenomena of vitality. To the gradual manner in which colloidal changes take place (for they always demand time as an element), may the characteristic protraction of chemico-organic changes also be referred.

"The class of colloids includes not only all those most complex nitrogenous compounds characteristic of organic tissue, and sundry of the oxyhydro-carbons found along with them; but significantly enough, it includes several of those substances classed as inorganic, which enter into organized structures. * *

"A portion of organic matter in a state to exhibit those phenomena which the biologist deals with, is, however, something far more complex than the separate organic matters we have been studying; since a portion of organic matter in its integrity, contains several of these.

"In the first place, no one of those colloids which make up the mass of a living body, appears capable of carrying on vital changes by itself: it is always associated with other colloids. A portion of animal-tissue, however minute, almost always contains more than one form of protein-substance: different chemical modifications of albumen and gelatine are present together, as well as, probably, a soluble and insoluble modification of each; and there is usually more or less of fatty matter. In a single vegetal cell, the minute quantity of nitrogenous colloid present, is imbedded in colloids of the non-nitrogenous class. The microscope makes it at once manifest, that even the smallest and simplest organic forms are not absolutely homogeneous.

"Further, we have to contemplate organic tissue, formed of mingled colloids in both soluble and insoluble states, as permeated throughout by crystalloids. Some of these crystalloids, as oxygen,[1] water, and perhaps certain salts, are agents of decomposition; some, as the saccharine and fatty matters, are probably materials for decomposition; and some, as carbonic acid, water, urea, kreatine, and kreatinine, are products of decomposition. Into the mass of mingled colloids, mostly insoluble and where soluble of very low molecular mobility or diffusive power, we have constantly passing, crystalloids of high molecular mobility or diffusive power, that are capable of decomposing these complex colloids; and from these complex colloids, so decomposed, there result other crystalloids (the two chief ones extremely simple and mobile, and the rest comparatively so) which diffuse away as rapidly as they are formed.

"And now we may clearly see the necessity for that peculiar composition which we find in organic matter. On the one hand, were it not for the extreme molecular mobility possessed by three of its chief elements out of the four; and were it not for the consequently high molecular mobility of their simpler compounds; there could not be this quick escape of the waste products of organic action; and there could not be that continuously active change of matter which vitality implies. On the other hand, were it not for the union of these extremely

[1] It will perhaps seem strange to class oxygen as a crystalloid. But inasmuch as the crystalloids are distinguished from the colloids by their atomic simplicity, and inasmuch as sundry gases are reducible to a crystalline state, we are justified in so classing it.

mobile elements into immensely complex compounds, having relatively vast atoms that are made comparatively immobile by their inertia, there could not result that mechanical fixity which prevents the components of living tissue from diffusing away along with the effete matters produced by the decomposition of tissue."

In view of the difficulties encountered in the differential comparison of organic and inorganic bodies, Lewes proposes the following theory, the mere suggestion of which shows how little reliable are the scholastic definitions which have been indulged in since the days of Vicq d'Azyr.

After announcing the static laws of organized substances, already referred to, he says:—

"Matter may be considered under three aspects: 1st. Non-organized; 2d. Organizable, or partly organized; 3d. Organized. For these three conditions I propose the names of Anorganic, Merorganic, and Teleorganic.

"I. Anorganic matter is that usually termed inorganic—water, salts, minerals, &c.

"II. Merorganic matter is matter in an intermediate state, wherein it either wants some addition to become organized, or else (as in organic products), has lost some of the elements it had when organized. Thus, the blastema from which cells are formed is the highest condition of merorganic matter—it is just on the eve of becoming vital. So also the cells which have lost their vitality in the very fulfilment of their function are all merorganic.

"III. Teleorganic matter is matter in that condition in which the cell, fully equipped, can and does perform its function.

"From this classification it appears that the passage from the inorganic to the organic does not take place directly; but the anorganic passes into the merorganic, and the merorganic into the organic. What is the indispensable condition of this final passage? What is it which makes the merorganic substance vital? What is the form which being universal may be supposed indispensable to organic life? Half the prosperity of philosophy lies in being able to put a definite question. Interrogate Nature and she will answer. She answers in this case emphatically—*a cell.*

"*Merorganic substances become teleorganic by the assumption of a spherical form.*

"Thus, then, the passage from the inorganic to the organic is a triple process of differentiation. 1. Of Elements; 2. Of Synthesis; 3. Of Form; and the union of 'higher multiples' (in certain determinate conditions named 'proximate principles') with 'Spherical Form,' is the final step which determines vitality."[1]

The passages just quoted are well worthy our attentive consideration. They clearly set forth the gradual nature of the transition of matter from the inorganic to the organic state, and show what little reliance can be placed upon the compositional distinctions which have from time to time been employed as a basis for classification. We must object, however, to the use of the word "spherical" instead of cellular, and still more to the logic which conducts us to the conclusion enunciated above in the italicized sentence.

It is well known that the vapour of water in condensing into snow or hail not unfrequently takes a spherical form. Boutigny, in his experiments upon the spheroidal condition of bodies, has shown that water projected upon a hot metallic plate instantly assumes a spheroidal form, an internal motion of its particles being observed at the same time. If iodine, which is a volatile element, be thrown into a red-hot capsule, it is at once transformed into a spheroid. Potash rapidly combines with iodine, but if a piece of this alkali is thrown upon it in the capsule, it also takes the sphe-

[1] Op. cit., pp. 152, 153, 157, 161.

roidal form, and both bodies revolve independently of each other, their chemical affinities being entirely suspended; but allow the capsule to cool, and they combine immediately.[1]

Here, then, we witness inorganic matter suddenly becoming spheroidal without becoming organic, and exhibiting great motorial activity together with a remarkable suspension of chemical affinity. With such facts before us, we are compelled to regard the language of the above static law as inaccurate. Mr. Lewes undoubtedly meant to say that merorganic substances become teleorganic by the assumption of a *cellular* form.

But is the idea expressed by this law true in point of fact? Let us follow its able and enthusiastic expositor in his comments upon it. He considers the blastema or nutrient fluid, made up as it is of the higher multiples and the proximate principles of indefinite composition, as organizable but not vital; and the only known and decisive condition which can transform this blastema into a vital substance is simply the assumption of a spherical form. This form is the last step in the process, and by the loss of it the cell loses its peculiar vital characteristic—its reproductive power:

"I have been asked," he writes, "and shall be asked again, 'Whence this spherical form? What is the cause which determines these higher multiples to assume the spherical form?' I do not know. The question is one which no positive philosopher will ask, recognizing as he does the impossibility of our ever knowing *causes*. He endeavours to trace the 'relation of existence and succession,' and is content if he succeed. In the foregoing pages I have endeavoured to trace the statical conditions which characterize organic substances. If they are accurately traced, you have no more right to ask me *what causes* the protein compounds to become spheroid than you have to ask what causes a saline solution to assume a rhomboidal solidity and become crystal. These are ultimate facts—the hieroglyphs no priest can read."[2]

We have long considered it a radical defect in the positive philosophy of August Comte, so ably advocated by Mr. Lewes, that it concentrates attention upon the purely phenomenal to the exclusion of all reference to scientific causation. It deals too much with results and too little with the hidden springs of action. It observes phenomena, records the order of their succession, and is content with finding the cause of each phenomenon in some immediately antecedent event. It is convinced that abstract secondary causation does not exist, and that the search after essential causes is vain; that beyond rational empiricism there is for science nothing but illusion and hypothesis; that the physiologist must limit himself to describe the functions of the organism without pretending to seize the proximate cause of these functions; and dogmatically asserts, *de haut en bas*, that the attempt to solve such problems has been discarded from the list of legitimate objects for scientific inquiry.

In such dicta we can discover no sympathy with the grand and truly philosophical efforts made at various times to reduce the multitudinous and complicated phenomena of biology to the fewest and simplest expressions or laws which are capable of explaining them, and thereby satisfying the earnest and inspired longings which the human mind has ever exhibited and ever will exhibit to become acquainted with the *causæ rerum*.

[1] Sur les phénomènes que présentent les corps projetés sur des surfaces chaudes. Annales de Chimie et de Physique, t. xi. p. 16. See also Comptes Rendus, 6 Mars, 1848, and Hunt's Poetry of Science, or Studies of the Physical Phenomena of Nature, Boston, 1850.

[2] Op. cit., pp. 158, 159.

To consider every fact, the cause of which is not evident upon the slightest reflection, as ultimate and inexplicable, is to class ourselves with those who, in the quaint language of Bishop Berkely, "are accustomed rather to compute than to think; earnest rather to go on fast and far than solicitous to set out warily and see their way distinctly."

With a more hopeful conviction of the capabilities of the human mind, and a profounder trust in the simplicity and harmony of nature, let us rather say, with the illustrious author of the *Novum Organon*: "If any one think that the secrets of nature remain shut up, as it were, with the seal of God, and by some mandate interdicted to human wisdom, we shall address ourselves to remove this weak and jealous notion; and, relying on simple truth, shall bring the inquiry to this issue, not only to silence the howl of superstition, but to draw religion herself to our side."

Entertaining such views, we feel it incumbent upon us not to be satisfied with the statement that the organizable blastema becomes vital by the assumption of a spheroidal form. With great propriety we may ask, indeed, if this statement be true. Does globular or cellular *form* give vital activity to the plastic, albuminous fluid? Or, rather, is not this form at once the manifestation and result of the vital activity of the blastema? Does not the process of cytogenesis indicate the presence of some force or agent, correlated it may be with the physical forces or imponderables, so called, by which the atoms of the blastema are aggregated together so as to form a globular body? And if this be so, should we not, as earnest seekers after truth, instead of regarding form and composition as the impenetrable veil of Isis, go behind form and composition, and grapple with those ultimate facts of whose activity form in the concrete is the visible manifestation?

The cell is the primary and simplest form of organized matter. From it are derived all the tissues and organs, whether simple or compound, that make up the entire vegetable and animal fabric. The interesting processes of development, growth, nutrition, and decay, are but the visible expressions of the activity of this self-multiplying and self-metamorphosing cell. Constituting the unity of animated nature, the *punctum saliens* of all the conditions of organization, the philosophic mind beholds in it the neutral ground upon which all the misleading distinctions between animality and vegetality are obliterated and the distinctions of species in nature shown to be fallacious.

Thus, then, this peculiar collocation of inorganic elements specially endowed, and constituting, as it were, the first decided morphological remove from the inorganic world, presents itself for our consideration with claims of the highest character. Its origin, chemical composition, physical structure, term of existence and decay, and all its properties, whether chemical, physical, or vital, are each separately deserving of the most careful and elaborate study.

And, first, the form of the cell especially merits our attention, since to it all organized forms are directly or indirectly related; to its variations all the motorial phenomena of the organism are directly or proximately due; and, lastly, because its study distinctly involves the consideration of the modes of action of the formative force—the principle or agent which alone possesses the property or power of "evolving forms out of formless matter."

Natural orders, classes, families, genera and species when carefully and

philosophically analyzed, are found to depend for their existence upon certain typical laws of formation, a knowledge of which is obtained only by accurately comparing together the common morphological periods presented by all animals in the process of their development from the simple cell to a positive and determinate specific expression. Development is formation, and formation as an act or process implies form as its determinate result, always the same under like conditions. Form in the hands of both the naturalist and the physicist is a valuable guide. Buffon tells us that "that which is most constant, most unchangeable in nature is the impress or mould of each species, both in animals and in plants; that which is most variable and corruptible is the substance of which they are composed." So also Cuvier writes—"the form of bodies is more essential to them than the material, since this latter changes unceasingly, while the other is maintained."

"That which constitutes the *being* of a living body," says Flourens, "and, consequently, its identity, its sameness, is precisely what does not change; that is its form, its force, that force of which the material is only the depository: that which changes is precisely that which is not itself, that is the material." And again, "in everything which has life the form is more persistent than the material."

"But the phenomena which most unquestionably characterize organic nature," writes Prof. Jackson, "are the perpetual production of special organic matter, and repetitions in successive generations of the same typical forms, infinite in number and variety, expressed in the organization of living beings. Organic forms proceed from formless plastic matter now as at the beginning. But the most striking and familiar feature distinguishing organic forms, at once mysterious and undefinable, is the permanency of the created *form*, while the *material* expressing that form is the most unstable and transitory of substances."

The more we push our inquiries into the domain of natural phenomena the more forcibly are we led to the recognition of the importance of form and composition. Form as an entity cannot exist independently of a material substratum—a formative or plastic material. The mathematical accuracy with which the particles of matter move in the assumption of form implies the active presence of a motorial principle or molecular force. Form, composition and a moving principle are the three elements presented for study in the crystal and the organic cell.

Dr. Carl Schmidt asks and settles for himself this pertinent question. "Does an analogous combination of the chemical go hand in hand with the homonymous development of the morphological elements or not? In other words is there any connection between the elementary constitution of matter and its external, mathematically definable, and appropriate limitation in space?"[1] An extensive and scrutinizing chemical investigation enables him to answer this question in the affirmative, thus experimentally confirming in great measure the famous law laid down by Reil in his "*Archives*," that "the phenomena of individual life are the necessary result of form and composition;" confirming too the generalization of Mulder, that "by matter and form, by form and matter, all that we observe in nature is to a great extent determined. This general conclusion is drawn from the innumerable phenomena we perceive in the organic world—phenomena which differ whether, on the one hand, the materials are the same and the forms differ

[1] Contributions to the Comparative Physiology of the Invertebrate Animals, being a Physiologico-Chemical Investigation. Scientific Memoirs. Vol. v. part 17, p. 1.

or, on the other, the materials differ, while the forms are the same." But form, philosophically considered, is only the individuation of matter, the mode in which matter assumes a certain specific identity or characteristic individuality of expression. There are many facts which tend to the conclusion that ponderable matter is, of itself, powerless to move and therefore to assume forms. Hence we must regard form and composition as the proximate cause, or rather antecedent condition through which natural phenomena are manifested.

In another place we have been at considerable pains to collect together numerous and striking facts which throw much light upon the cause of the forms of inorganic bodies.[1] My space permits me to allude to a few only of the conclusions there arrived at, and which have an immediate bearing upon the subject in question. Thus it appears that between the form and ponderable atomic constitution of a body no invariable connection can be made out; that the forms of crystals are immediately dependent upon peculiar axial proportions, which are themselves the results of a certain molecular arrangement; that molecular arrangement and disarrangement presupposes a motor agent; while the definite and constant relation between changes in aggregation and variations in form, implies the materiality of this agent and its continued presence whether in the same or varying quantities; that this agent has periods of action and periods of rest; that caloric is a positive material entity—an essential element in all bodies, always present in varying proportions; that caloric is self-repellent and endowed with great physical power; that crystalline form is the visible representative of atomic volume; that isomorphous bodies have sensibly the same atomic heat and the same volume; that in elementary and compound isomorphous groups, the numbers indicating atomic heat and volume are simply related; that at certain temperatures the elements may all be made to assume the same form; that variation in the atomic heat of a body is accompanied by variation in its form; that atomic heat is the cause of isomorphism and polymorphism, consequently of crystalline form in general.

From all this it would appear that in the act of crystallization we must recognize a peculiar force or agent which aggregates particles and gives to them, not only form, but probably also all those so-called properties which constitute the specific and characteristic attributes of the body, which makes gold, gold, and iron, iron, &c. Just as "in the simple act of cytogenesis we recognize a force in operation which converts certain chemical compounds into a living organized structure, not only moulding them into a peculiar and characteristic form, but endowing them with new attributes."[2]

The varied and interesting transformations which constitute the cytogenetic process are in fact but the prototype in miniature of the development of the entire vegetable or animal organism from which the cell originally sprung. At first sight these phenomena appear to be totally different from those presented by the so-called inanimate world. But a closer inspection shows that some at least of them are fairly attributable to the action of chemical and physical laws, and the progress of discovery tends more and more to bring them all within the category of physico-chemical science, or, in other words, to show that physiology is neither more nor less than the

[1] Essay on the Relation of Atomic Heat to Crystalline Forms. Journal of the Academy of Natural Sciences, vol. iii. p. 105.

[2] Carpenter, Principles of Human Physiology, Philada., 1853, p. 129.

physics of the organism.[1] Cell-formation itself appears to be regarded by Schleiden as simply a chemical act.[2]

In 1807, Dr. Thomas Young, in his *Lectures on Natural Philosophy and the Mechanical Arts*, and in 1824, M. Biot, in his *Précis Elémentaire de Physique*, recognized and announced as a fundamental principle of the inorganic world, that solidification is a process identical with crystallization. The proofs of this proposition are so abundant that it is now generally accepted by physicists.

The limitation of this identity to solidification as it occurs in inorganic matter, appears to us, however, to be entirely too restricted a method of viewing the comprehensive and intimately connected operations of nature. The significance of this remark will be perceived when we reflect how utterly impossible it is to draw a positive line of demarcation between organic and inorganic matter, the transition from the one to the other being so gradual, that none can say here one begins and the other ends.

"We cannot indeed," very philosophically writes Dr. Kirkes, "draw an absolute rule of chemical distinction between the two classes (of organic and inorganic matter), for there are substances which present every gradation of composition between those that are quite organic and those that are inorganic. Such substances of intermediate composition are many that are formed when inorganic matters, taken as nutriment by plants, gradually assume the characters of organic matter, under the influence of the vital properties of the plant; and such are those which are found in both plants and animals, when, out of the well organized tissues, or out of the sap or blood, materials are being separated, to form either tissues for mechanical service, or stores for nutriment, or purifying excretions. In both cases, the substances that are in the state of transition between the organic and the inorganic, or between the more and the less organized states, may proceed through changes so gradual that no natural line of

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[1] "The time will come, and is no longer distant, when the entire physiology of animal life will be resolved into physiological physics and physiological chemistry."—Prof. C. G. Lehman, *Manual of Chemical Physiology*, Amer. ed., p. 54.

"The ultimate laws or principles of physiology are the ultimate laws or principles of chemistry and natural philosophy."—Lardner Vanuxem. *An Essay on the Ultimate Principles of Chemistry, Natural Philosophy and Physiology*, deduced from the distribution of matter into two classes or kinds. Part 1. Philada. 1827, p. 84.

"The more our knowledge of these two departments (living and dead matter) is extended, and the nearer the several parts of the great science of nature are seen to approximate, the more firmly must we embrace the idea, as necessarily conformable to truth, that the same forces govern alike the animate and inanimate kingdoms."—Mulder, *op. cit.*, p. 2.

"The philosophers of the last century thought that the vital principle was antagonistic to inorganic laws, and by suspending their actions, maintained the body in life and health; but it has been reserved for the present generation to show that the same laws of physical force which are indissolubly linked and correlated in the inorganic world are also the mainspring of the wonderful actional properties of life, and that from chemical and destructive changes the source of the mechanical powers of animated beings is obtained, and which force or energy is never destroyed or obliterated—all organic nature being, equally with inorganic, subjected to one universal conservation of force."—*Annual of Scientific Discovery for* 1863, p. 189.

[2] "If we regard the easy transformation of the assimilated matters, and may from artificially conducted experiments draw the conclusion that the nitrogenous matter which I have called mucus, and which forms the cytoblast, is the substance which calls forth these transformations, and if we farther remark that sugar and dextrin are more easily soluble than jelly, and that sugar and gum are changed into jelly if the quantity of water is not increased, and which must be necessarily precipitated, we must regard the whole process of cell-formation as simply a chemical act."—*Principles of Scientific Botany*, p. 35.

demarcation between the two states can be discerned; and one cannot say when that which has been called inorganic has acquired the characters of an organic body, or when that which has been organic ceases to deserve the name. Alcohol, ether, acetic acid, urea, uric acid, and the fatty and oily matters, are such substances of organic origin, and intimately related to such as no one would hesitate to call organic, yet in their simplicity and mode of composition they are like inorganic matters."[1]

In view of these facts concerning the unity of organic and inorganic matter we are constrained to regard all solidification as essentially the same.

"If then," says Prof. Dana, "crystallization and solidification are properly one and the same process, the laws that govern in crystallization are the laws of cohesive attraction. The science of crystals instead of treating only of certain singular polyhedral forms assumed by minerals, is the study of the fundamental agency by which inorganic matter is governed in its aggregations."[2]

Similarly the study of the development of animals and plants is the study of the aggregation of organic atoms and their assumption of specific forms. The science of physiology is, therefore, simply the study of the fundamental agency by which such atoms are aggregated and governed in their movements of formation and deformation, composition and decomposition. But if solidification be virtually the same process wherever it occurs, and if crystallization is identical with solidification, or, as Dr. Young expresses it, "is the universal cause of solidity," then it follows that from the laws of crystallization we may learn much concerning the laws of organic formation, as these latter are manifested in the processes of reproduction, growth, and development.[3] Now, it is very evident that these so-called laws of crystallization are merely the generalized expressions of the particular motorial changes which the atoms of ponderable matter undergo in their transition towards a fixed and determinate form.

The characteristic tendency of organic matter is, as we have already

[1] Manual of Physiology, 2d Amer. ed., p. 27.

[2] On Certain Laws of Cohesive Attraction. By Jas. D. Dana. Amer. Journ. Sci., 2d ser., Nov. 1847.

[3] Some of the more prominent of these laws of crystallization, as laid down by Prof. Dana in the article already quoted, may be advantageously referred to here.

1. The different kinds of inorganic matter have each a distinct mode of crystallization.

2. The fixed angles for each species of matter in some way characterize molecular or cohesive attraction.

3. Polygonal forms result from the attraction acting more strongly in certain specific directions than in others. If the attraction acted alike in every direction it would produce a sphere.

4. Cohesive attraction is characterized by fixed angles as regards the direction of its action, and by specific relations of force in certain axial directions; and it differs in these particulars for different substances.

The whole science of crystals is based upon rigorous mathematical laws. Various attempts, more or less successful, have been made to demonstrate that this is true also of organic bodies.*

5. The axial lines of cohesive attraction are not indefinitely fixed in position, but are in some way modified in direction and force by temperature.

6. The action of cohesive attraction is often intermittent, producing seriate results (as exemplified in the cleavage of crystals); and the specific rate of intermittent action is different for unequal axes.

* See Studies in Organic Morphology, by John Warner, Philadelphia, 1857. Also, by the same author, Contributions to Organic Morphology: containing the mathematical imitation of the Egg of Planorbis Corneus, and Epicrus; and upon the resemblances between Mathematical, Acoustic, Electric, Optical, and Organic Figures.—*Proceed. Acad. Nat. Sci.*, Dec. 1862, p. 525.

seen, to take on the rounded or globular form; while angularity, or the polyhedric shape, stamps the inorganic world. Now, with these peculiarities must be associated other features, such as the fact that organic matter is tougher, less brittle, and has more elastic power to elude disruptive forces than inorganic.

It is a general and well-known law in physics that a reduction in the temperature of metals, whether by condensation under the hammer, exposure to a very cold medium, or in any other manner, is accompanied by a loss of tenacity or cohesive power between the particles of the body whose temperature has been diminished, so that they become so brittle as to be broken oftentimes with the slightest blow. Especially is this the case if the cooling be very sudden, as is shown in many minerals, steel, glass, and other substances. The addition of caloric, on the other hand, gives rise to or increases the property of malleability, as Black clearly showed. In this connection it is worthy of remark that substances which, in the uncrystallized state, are more or less tough, become brittle upon crystallizing. In his philosophical, but little-known essay referred to above, Lardner Vanuxem cites many examples of this fact with a view to their bearing upon the interesting subject under consideration.

"Thus pure iron is extremely tough, and exhibits no crystalline appearance; but if it be combined with a small portion of carbon, phosphorus, sulphur, silver, &c., it loses its toughness and acquires a crystalline or lamellar fracture. Silver, when suddenly congealed, is a brittle metal, for it is then in the crystalline state; but when melted, if it be slowly cooled, it loses its crystalline state and becomes tough. Zinc is extremely brittle at the ordinary temperature of the atmosphere, and is highly crystalline in its fracture, but if heated to a certain degree it becomes a malleable metal."

"The fibrous state of minerals appears to be a semi-crystallized state, for the fibrous varieties of the same species of minerals are more tough than those varieties which are crystals or present a higher degree of crystallization than the fibrous state."

Now, crystallization is always accompanied by an evolution of heat.

Thus, then, we necessarily arrive at the conclusion that the fibrous and crystalline conditions, and the properties of malleability and brittleness, are intimately connected with, and, in fact, dependent upon, the calorific condition.

Here we see, as a general thing, toughness and malleability associated, and depending on a higher calorific state; while brittleness and the crystalline condition are combined with a lower calorific state. Exactly in what manner heat acts to produce this property of toughness, it is difficult to describe. But certainly all the facts of physical and chemical science lead to the supposition that it can only be induced by some atomic or molecular change, and most probably by the production of the globular form, "for that state, as it causes particles to present a greater surface to one another when struck, from the flattening produced, must have their attractive power increased; whilst in polyhedral forms, no property of this kind can exist."

"These facts, and others equally well known, of the effects of heat upon inorganic matter, confirm the opinion advanced by some physiologists, namely, that the elementary particles of organic matter were globular; and accounts for the greater toughness of organic matter, compared with inorganic matter; as well as for the opinions entertained of the forms of matter; for we find that particles of common matter, uncombined with ethereal matter, are polyhedral; but when combined with ethereal matter are globular."

As we have said above toughness pre-eminently characterizes organic matter, and here we find fully developed the globular form.

Now it is a well-established fact that organic matter is composed mainly of the gaseous elements—the lightest and most ethereal kinds of matter known to the chemist—that, in fact, which has the most caloric around its particles, while inorganic matter is composed of the most inert and heaviest, that which has least caloric.

"There is," writes Spencer, "a certain significance in this. When we remember how those redistributions of matter and motion which constitute evolution, structural and functional, imply motion in the units that are redistributed; we shall see a probable meaning in the fact that organic bodies, which exhibit the phenomena of evolution in so high a degree, are mainly composed of ultimate units having extreme mobility. * * * * * * * One of the leading properties of any substance is its degree of molecular mobility; and its degree of molecular mobility more or less sensibly affects the molecular mobilities of the various compounds into which it enters. *Hence we may infer some relation between the gaseous form of three out of the four chief organic elements, and that comparative readiness displayed by organic matters to undergo those changes in the arrangement of parts which we call development, and those transformations of motion which we call function.*"[1]

From the interesting experiments of Acherson, so ably discussed by Wittich, Harting, Melsens, Panum, and others, and from what we know of the progressive physical changes which take place in the chyle as it passes onwards through the lacteals into the thoracic duct, we see that the globular form of the organic cell is that naturally assumed when oily and albuminous matters are brought into contact. But oil and albumen consist of hydrogen, oxygen, nitrogen, and carbon chiefly—the most ethereal forms of matter, those in other words possessing the highest calorific condition and exhibiting the greatest degree of molecular mobility.

In this conjunction the experiments of Boutigny, already referred to, are worthy of consideration. These experiments show us, among other truths, that certain inorganic substances may be made to assume the globular or spheroidal form by increasing artificially their calorific condition, or, in other words, by rendering their calorific condition in a measure analogous to that which, owing to their peculiar material composition, naturally appertains to organic substances.

These facts, taken in connection with numerous others marshalled in argumentative array in our Essay on Atomic Heat in relation to Crystalline Form, clearly indicate that the forms of bodies are not "ultimate facts," not "hieroglyphs no priest can read," and that vital phenomena result not from the union of proximate principles with spherical form, as Lewes maintains; but, on the contrary, find their origin and cause in those molecular movements by means of which forms are evolved from a structureless, homogeneous blastema, and which constitute the primitive steps in that complex series of differential changes which make up the physiological history of growth and development in both the vegetable and animal worlds.

An attentive study of these changes and a comparison of them with the molecular movements which in the inorganic world result in the production of crystalline form, must in the end shed a flood of light upon the active principle or force which produces these changes alike in both divisions of

[1] We have italicized the above sentence on account of the deeply important generalization which it enunciates.

nature. Philosophy and science are equally hopeful, indeed, that a careful analysis and comparison of the varied phenomena exhibited by the different departments of nature, will lead to the identification of their physical causes as modifications of one great force or principle which pervades and binds together the whole universe, and in which, as the chief agent in the hands of an omnipotent Deity, will be found the physical unity of nature.

The more intimately we become acquainted with the statical and dynamical characters of organic and inorganic matter, the more closely do we find these two kingdoms encroaching upon and blending with each other like the different tints or hues of any particular colour. The more boldly we push our researches into the vast unknown, the more evident is it that the phenomena of the inanimate world are inseparably linked to those of the animate, and that all the mechanical, chemical, and vital actions of matter glide into each other so regularly and so gradually that the conclusion is undeniable that they are parts of one grand phenomenon. To this scientific truth the philosopher-poet of Germany has given a fitting harmonic expression.

> "Wie alles sich zum Ganzen webt,
> Eins in dem andern wirkt und lebt?
> Wie Himmelskräfte auf- und niedersteigen
> Und sich die goldnen Eimer reichen,
> Mit segenduftenden Schwingen
> Vom Himmel durch die Erde dringen,
> Harmonisch all das All durchklingen."
>
> FAUST'S *Soliloquy.*

The material world is in truth one great whole, and the details of its study thus far accumulated authorize us to conclude that the passage from the simplest to the most complex form is through gradual and insensible transitions. At one end of the series we have elementary or binary matters composed chiefly of metallic bases, the most dense, gross, and inert of the ponderables; and at the other end bodies composed in great part of the most light, active, and mobile species of matter. Between these two extremes there is no absolute *essential* difference. Everywhere we encounter the same matter and the same forces. Increasing complexity of structure is associated step by step with increasing complexity in the axial directions along which force exerts itself. Complex combinations of molecules beget complex phenomena, which may be varied indefinitely according as molecular arrangement is altered. From the beautiful labours of Pasteur, just passed in review, we learn how an important physiological process is influenced by a change in molecular arrangement. The researches and observations of Boutigny, Vanuxem, and many others whose names might readily be mentioned, and the admirable generalizations of Spencer quoted above, all significantly point towards this great philosophical truth, that between the so-called dead and living nature phenomenal differences only can be demonstrated. As the animal or vegetable cell, in running through its career of development, passes from the general to the special, from the homogeneous to the heterogeneous, so the organic world, as a whole, with all its varied life-manifestations, is simply an evolution from the inorganic.

From these statements, it is evident that a truthful and comprehensive theory of organization should, as one of its prominent features, connect rather than dissociate the inorganic and organic worlds. Let it not be said that such a theory detracts from the doctrine of life.[1] On the contrary,

[1] See Mulder, op. cit., p. 1.

we see in this dissociating influence, an inherent defect in the opposite, or so-called teleological theory. The latter separates nature, so to speak, from itself. It limits nature by claiming for a part what alone can be predicated of the whole. It assigns a superior dignity to organic matter as such, forgetting that the test of dignity is function alone.[1] Carbon, oxygen, hydrogen, and nitrogen have a much more exalted rôle to perform in the animal economy, and consequently may be said to be more dignified than the same elements which, after the death of the animal, come to constitute a crystal of carbonate of ammonia, where their sole duty is the preservation of a definite form. An organized form, according to Burnett, is simply a colligation of molecules of plastic matter occurring under the direction of a determinate idea or force. In common with most teleological writers, he thinks that this force must be peculiar and different from any belonging to matter generally; that it is an immaterial one, and can be likened to no other in nature with which we are acquainted. If we define an organism as simply a collection of molecules of plastic matter arranged in accordance with a certain type or species to which it belongs, we may similarly say of a crystal, that it is an aggregation of molecules arranged in conformity with a certain definite form. In this case the molecules are not plastic in the physiological meaning of the term. Nevertheless, the cause of crystallization is enveloped in as much obscurity as the cause of life and its diversified phenomena, and, without doubt, an explanation of the one would tend measurably to dissipate the mystery of the other. The physical nature of the first no one questions, but in treating of the second, the teleologist resorts to the action of forces that "can be likened to no other in nature with which we are acquainted." Writers of this school, of which we consider the remarks of Burnett on the philosophical relations of cell-studies to be a fitting representative, speak of organism as existing in virtue of pre-existent ideas in nature, the antecedent and immaterial form expressing itself in matter. This is the Platonic conception, somewhat curtailed, however, of its comprehensiveness. For that philosopher, judging from many passages in his writings, especially in the tenth book of the Republic, appears to have thought that there was an antecedent divine idea or image of *all* things in nature, inanimate as well as animate, thus, in reality, maintaining the physical theory of organization.

"Adopting the physical theory, one does not recognize," says Burnett, "that the forces of organized are more in number, or different in character from those of unorganized matter, the fact of organization being due to a certain combination of powers possessed by all material forms. And when this combination has once taken place, there necessarily results in virtue of it, and the forces impressed on matter in its beginning, a certain end, which is called individual existence. The common phenomena of organization, therefore, are due to the blind working of the laws of necessity, and which are irrespective of any purpose."[2]

Now very certainly all purposive effort must reside in and be co-existent with the Efficient Cause of all things. This fundamental, theistic fact is lost sight of by the supporters of the teleological doctrine. Taking it as a stand-point, we cannot avoid the conclusion that, the purposive effort keeps

[1] The Cell; its Physiology, Pathology, and Philosophy. Part III. The Relation of Cells to the Physical and to the Teleological View of Organization, by Waldo J. Burnett, M. D., of Boston. Transactions of the Amer. Med. Association, vol. vi. p. 820.

[2] Op. cit., p. 821.

pace with the active developing laws of nature, and gives to them an intelligential aspect. Otherwise the Almighty cannot be said to be displayed in all his works. Physical forces thus purposively impressed from the beginning become active agents working out, not blindly, but intelligently, the so-called "individual adaptation" in all places, assigning a definite object or purpose as well as a definite form to all things. Such a view admits of no blind, necessitous action in any department of nature, but recognizes in both the inorganic and organic worlds that unity of purpose and of action upon which their harmony depends, and which manifests itself by regular, orderly working through all space and all time.

The advocates of the teleological doctrine contend that the adaptation perceived in the organic differs in character from that exhibited in the inorganic world; the latter being considered as "having reference only to existing circumstances, while the only surety of its continuation is in the persistence of the forces on which it depends." It is not difficult to find refutations of this very restricted mode of viewing the operations of nature. Let us examine, for a moment, the phenomena or laws of motion as displayed, on a scale so grand, in the solar system. It is familiar knowledge that the sun turns on its axis from west to east; that the planets all revolve in a plane passing through the sun's axis, and in the same direction as that luminary; that these planets rotate upon their axes, the satellites revolve around their primaries, and also upon their axes in the same direction. Equally well known is it that the intensity of light or heat emitted from an incandescent body diminishes in proportion as the squares of the distance increase.[1] From these data it will be seen that a remarkable adaptation exists between the motions of the planets and the calorific power of the sun. For the heating power of the sun, the centrifugal force by which the planets and their satellites are impelled through their orbits, and the centripetal force by which planets are impelled towards the sun, and satellites towards their primaries, are alike seen to diminish in proportion as the squares of the distance increase. Furthermore, by combining the centripetal and centrifugal forces a compound force results, which is the determining agency of the periodic times, or velocity of the planets, and which constitutes the third law of Kepler, that there is a distinct and definite relation between the velocity of the planets and their distance from the sun. The teleological element exists in this relation as well as in the organized kingdom. The adaptation, here, does not consist in mere harmonic action, but is in reality an intelligential production of cause and effect. Without this motion of revolution around the sun, and rotation upon their axes, the planets would be deprived of that change of seasons and alternations of day and night, upon which so many of our climatic phenomena depend. We are perfectly justified in considering these results as constituting at least one purpose or object for the accomplishment of which the law is in action. In this example, then, the reason or purpose may be said to pre-exist its embodiment or expression in the moving planet, accompanying and co-operating with the physical agent in virtue of the fact that all purposive effort must reside in the great Efficient Cause—the world's Supreme Architect.

Take another example, as simple and as well established as it is applicable to the subject under consideration. It is a general law that liquids

[1] "The intensity of heat varies inversely as the square of the distance from the radiant point." (Gmelin.)

expand by the addition of heat. No liquid is so generally diffused and plays so important a part in the economy of nature as water, which, singularly enough, between certain thermometric limits, is the only exception to this law. From about 32° of Fahrenheit's scale it contracts for every additional increment of heat, until at about 39½ or 40°, it has attained its maximum density. Conversely, in cooling from 40° down to 32° it expands and becomes specifically lighter. If the mass is undisturbed so as to retain the liquid form, it may be seen to expand, even until cooled down to 20° or 25° below the freezing point. Upon this irregularity of contraction manifested by water in cooling, depends the well being of a considerable portion of the organized world. When winter sets in the surface-water of lakes, rivers, &c., begins to part with its caloric by radiation. This loss of heat is accompanied by contraction, increased density and consequent sinking of the heavier particles to give place to the warmer and lighter water which rises from below. This process continues until the mass has fallen to 40°. Then the beneficent peculiarity in question manifests itself. Further, loss of heat from the surface produces expansion, and diminished specific gravity, and the translation of water from above downwards, and from below upwards, ceases. Hence, while the mass of water below maintains a temperature of 40°, the surface-water steadily sinks towards the freezing point, when it is converted into a sheet of ice, which latter is an effectual barrier to the further loss of caloric. Thus, while the atmosphere of any locality suffers a most distressing depression of temperature, the waters of the rivers and lakes enjoy a much more comfortable temperature. Here then is a happy provision for maintaining intact the life of the finny inhabitants of these waters. During the severity of winter, were it not for this peculiar action on the part of water, the bed of the river would be entirely filled with solid ice, and piscatorial life necessarily annihilated. The philosophic mind must see in this physical property of water no merely accidental or chance action, but an adaptation in the inorganic, as positive and intelligential as any presented in the organic kingdom.

J. A. M.

ART. XIV.—*Contributions to Practical Medicine.* By JAMES BEGBIE, M. D., F. R. S. E., &c. Edinb., 1862. 8vo. pp. 318.

A PECULIARITY of English medical literature consists in its numerous collections of monographs, in the form of Society Transactions or in that of papers by distinguished physicians, which originally appeared as contributions to medical journals. In many cases, when first published, they formed the earliest introduction of their authors to the profession at large, and became the basis of an ever widening and strengthening reputation. It is gratifying, when a physician has attained his highest eminence, to examine the steps by which he reached it, to trace in his earlier productions the features of his maturer mind, and note with satisfaction how successfully the fruits of his later experience vindicate the approving judgment which was originally passed upon the work of an author, at the time, perhaps, but little known, or who chose to test his claims to favour by anonymous publications. The papers in the present volume, however, were all, except one, read by their author before the Medico-Chirurgical Society of Edinburgh,

and published in the journals of the day, and while they contributed to elevate him among his immediate associates, they attracted attention, and served to mould opinions upon the subjects they discuss, wherever English medical literature exerts its legitimate influence. They reflect in a striking manner the characteristics of their author. Second to none of those common-sense medical philosophers who imbibed the true spirit of research and reasoning from Reid and Stewart, Dr. Begbie has spread over every page of his writings a hearty and honest tone, which we have reason to believe reflects a sound and genial nature, always on the alert to discern the hidden causes and relations of things, and always brimming over with thoughts which his companions and auditors are eager to possess. Perhaps the reader will best apprehend the character of the volume before us by recalling Dr. Holland's *Medical Notes and Reflections*. Its tone is scarcely less elevated, and it discloses a not inferior discernment; perhaps it differs from the work alluded to mainly in its closer adherence to what are reckoned practical subjects, or rather to a more exclusively practical manner of treating them.

The first paper in the volume, and which, as was stated already, has never before been published, treats of "Gout and the Gouty Diathesis." It is peculiarly interesting from the circumstance that the author, like so many others who have felicitously described the disease from which they chiefly suffered, is himself a victim of gout. If Sydenham drew from his own sufferings and the observations and reflections which they suggested, a picture of the disease which has forever associated his name with its history, we must admit that Dr. Begbie has endeavoured to finish the portrait by adding to it lineaments which are often masked under the guise of different affections, and whose name they bear instead of that which more properly belongs to them. Or, to quote the author's own statement, a summary of the doctrine he defends:—

"The primary effects of the gouty diathesis are those of a poison (uric acid), often slow and insidious, disturbing many functions, chiefly those of the digestive organs, and of the nervous centres; but sometimes more speedy, through its rapid accumulation in the system, engendering active disease in various tissues and organs of the body—the synovial, the mucous, and serous membranes, being peculiarly prone to be affected by it; while the heart, the liver and kidney participate largely in the general disorder." . . . "The altered or contaminated condition of the blood, in the gouty habit, has subsequently an injurious effect, either vitally or mechanically, on the muscular structure of the heart and bloodvessels, by weakening their power, and producing attentuation of their cavities and trunks, and leading to venous congestion and obstruction, and to their consequences, in hemorrhages, dropsical effusions, and similar affections." "Ultimately the heart and bloodvessels, through the continued prevalence of the diathesis, undergo structural changes by the deposition of earthy matter in their coats; and thus gout is intimately allied with palsy, apoplexy, and other cerebral diseases, and with angina, syncope, and rupture, and other fatal cardiac affections."

These passages scarcely display the extent to which Dr. Begbie believes that gout

"May disclose itself in every organ of the body, and complicate and involve every disturbance of the system. It may visit every part and every texture from the crown of the head to the sole of the foot, and molest, and vitiate every function appertaining to life."

He discovers it in the head in the form of intense and continued headache, in fits of giddiness, in transient affections of the senses, and its

intimate association with lethargy and coma in connection with serous effusion, the result of cerebral disease. He detects it in many cases of paraplegia and neuralgia, in otitis, tonsillitis, and relaxation of the uvula, in iritis, and sclerotitis, and in destructive inflammation of the eyeball. It plays a part, he maintains, in many cases of pneumonia, pleurisy, bronchitis, and hydrothorax; it "more than any other agent lays the foundation of irreparable mischief" in the heart and bloodvessels, and is "the immediate cause of some acute attacks of endocarditis and pericarditis."

"Gout," he asserts, "has frequently its seat in the organs of digestion, complicating their functional derangements, hurrying on their structural diseases, and terminating their organic lesions" . . . "is intimately connected with the disorders of the urinary organs; it is frequently the origin of renal disorder, of granular degeneration of the kidneys, and of puriform discharge from the urethra." . . . It "lurks in many functional diseases of the uterus, and discovers itself in some of its organic diseases. It is the fountain of many hemorrhages and many fluxes. It is the origin and essence of many cutaneous eruptions, and in the joints, the fruitful source of crippling, lameness, and deformity."

Truly gout is *fons malorum!* if we accept our author's interpretation of the cases, some of which are referred to in the above extracts. But this we are unable to do. Evidently all of these affections, diverse and even opposite in their nature, occur habitually in constitutions as free from gout as if such a disease had never existed; and if they sometimes are modified or even replaced by an open fit of gout in other cases, it only shows that this disease, like scrofula and other pre-eminently blood disorders, is capable of modifying the phenomena of more accidental affections. The efficacy of colchicum in the cure of such diseases may, and, we respectfully suggest, does prove only this, that the neutralization of the gouty poison permits nature to work her own cure of the affection which this poison maintained and aggravated. Gout, in such cases, we presume, may be regarded as one of the lædentia, the removal of which, in all methods of treatment, is essential to success.

Dr. Garrod, in his well-known work, has devoted a chapter to illustrating the various forms of irregular gout, and he more than intimates a doubt of views like those which are so strongly expressed, and so ingeniously illustrated by Dr. Begbie. Even after admitting that a gouty diathesis may produce symptoms apart from the joints which are essentially of a gouty character, he finds, when he comes to examine the several varieties of alleged irregular gout, that few of them can unequivocally be accepted as of that nature. He is even so irreverent as to quote with approbation Dr. Watson's remark that "the so-called *gout* in the stomach has sometimes turned out to be *pork* in the stomach." Long ago, Dr. Sutton complained that "the idea of this universal influence of the gout has had this effect, that every disease which has happened during an arthritic paroxysm has been considered to be gout." Earlier still the notion which Dr. Sutton reprobates was inculcated by continental writers. But among the most authoritative of recent French and German writers, as Vogel and Lebert, this confusion is criticized in strong terms. Undoubtedly, gout is a constitutional affection (a blood disease, as it is the present fashion to say), and as inborn peculiarities modify the phenomena of accidental diseases, so do acquired morbid habits produce this effect in a still greater degree, and none more so than the gouty habit. But we cannot assent to the view which magnifies a complication, and converts it into an efficient cause.

In reading the paper which treats of the connection of dyspepsia and nervous disorders with the oxalic acid diathesis, we were struck with the same feeling of uncertainty with which long ago the similar chapter in Dr. Prout's work inspired us. While it must be admitted that there are certain marked differences between the two states of the system referred to, it must also be allowed that so many symptoms are common to both, as to render their direct dependence upon the special condition of the blood a matter of serious doubt. In both the following symptoms occur, *e. g.:* A dry and harsh skin, scaly eruptions, feebleness of the lower limbs, hemorrhage from the bowels, disorder of the kidneys and bladder, dyspepsia, flatulence, and palpitation of the heart, irritable temper, hypochondriasis, and, in the gouty diathesis, oxalates and urates alternate with one another. In a word, the points of resemblance of the two conditions are much more numerous than those in which they differ, and much more than would account for the cure of the one by colchicum and of the other by nitro-muriatic acid, if we did not look beyond the minutiæ of the cases to see those broad and characteristic features in which they are strikingly contrasted—features which may briefly be described as those of the sanguine and of the melancholic temperament. But this fact, if admitted, does not furnish any clue to the essential differences of the two affections, which must be sought in those metamorphoses into which even the prying eye of organic chemistry has not yet thoroughly searched.

The paper on "the Relation of Rheumatism and Chorea" does not now call for so much attention as it deserved in 1847, when it was first published and when the relation had been noticed by only a few writers. The succeeding one, which treats of "the Connection of Erythema Nodosum with the Rheumatic Diathesis," and through it with uterine disorder, is interesting as an additional illustration of the closeness of relationship which exists between many local affections and certain general states of the system. "Anæmia and its Consequences" is the title of a very important chapter concerning an affection, sometimes described as "exophthalmic goitre," and which the author concludes to be a true anæmia, and curable by the ordinary remedies for that disease. If it were not something more, enlargement of the thyroid body and protrusion of the eyes, with palpitation of the heart would be of frequent occurrence, as frequent as anæmia itself; but, while the latter is every day met with, the former is so unusual as to have passed unperceived by the best observers of disease, until a very recent period. This superadded element has remained in doubt, although announced by various authors as a derangement of the organic nervous system. Meanwhile the clear and circumstantial exposition of Dr. Begbie demonstrates that an essential element of the affection is anæmia. His paper is peculiarly valuable as a history of the progress of observation in regard to exophthalmic goitre, and all who desire to be informed upon the subject, will find it their best guide. It is curious to observe how four of the medical celebrities of Paris, MM. Bouillaud, Piorry, Trousseau and Beau, so lately as a year ago, displayed marvellous ingenuity, and abounded in all the arts of the tribune while defending each his theory of the disease before the Academy of Medicine.

In this discussion we find M. Piorry, with characteristic originality, and with that tenacious adherence to mechanical views of disease for which he is so remarkable, maintaining that enlargement of the thyroid gland is the primary element of the disease, causing in its turn derangement of the heart's action by pressure upon the vascular trunks of the neck and upon

the branches of the cranial and the sympathetic nerves. These influences, according to him, determine imperfect hæmatosis and impair nutrition, while "habitual suffering, defective performance of the great functions, and sometimes congestion of the brain resulting from hindrances to its circulation, render the temper irritable and violent, produce habitual mental excitement, and predispose to anger." Consistently with these theoretical views he pronounces iodine the specific remedy.

M. Bouillaud does not hesitate to deny that palpitation of the heart has any necessary connection with exophthalmic goitre, because it is found in thousands of persons who are neither goitrous nor have protrusion of the eyes. He also ridicules the idea of calling the disease, as described by authors, a neurosis. "A comical neurosis, truly," he exclaims, "for according to the received nomenclature, a neurosis is a disease without visible lesion." After denying any necessary connection between the three characteristic elements of the affection, he concludes by attributing it chiefly to the habit of self-abuse. The connection between the disease and its alleged cause he confesses his inability to point out. In a note he makes, in a single line, a statement which is, perhaps, of more consequence than all the rest of his long and verbose oration. "We have shown," he remarks, "that the cardiac palpitations denote a nervous excitability coinciding with a state of chloro-anæmia." Taking so different a view as he does of the nature of the disease from that of M. Piorry, he, nevertheless, advocates the use of the same remedy, viz., iodine.

The oration of M. Beau is taken up with a lucid demonstration of the dependence of the functional symptoms of the disease upon anæmia, which, he contends, is associated with transitory hypertrophy of the heart. Unfortunately, he throws no light at all upon the causation of the projection of the eyeballs nor on that of the enlargement of the thyroid gland. It is not sufficient to say that those phenomena are sometimes absent. Usually they are not so; and the cause of their presence when they do occur is precisely what we desire to learn. A very important statement made by M. Beau, is that having carefully inquired into the causes to which the development of the disease was due in seven cases, he found them all to be such as affect the feelings deeply, as reverses of fortune, disappointed affection or ambition, &c. Against such causes, he very justly remarks, the materia medica contains no antidote.

The discourse of M. Trousseau was distinguished by that elegance and brilliancy which are the characteristics of his style, and which subject him to the criticisms of brother Academicians who may use language as keen and trenchant, but certainly neither so dazzling nor so clear. It was the first in order, but, as the most important, we have reserved it for notice until the last. Instead of assigning anæmia as the primary link in the chain of morbid conditions, he declares that nervous disorders, mental, gastric, or uterine precede or accompany the three characteristic phenomena of the disease; but the primary symptom is excessive action of the heart. This symptom he refers to disorder of the great sympathetic nerve, citing in explanation of his doctrine, the experiments of Claude Bernard. To the same disorder he attributes all the symptoms displayed by the great vessels, the digestive organs, the kidneys and the eyes, as well as the congestive enlargement of the thyroid body. Between him and M. Beau the most conspicuous difference is that the latter regards anæmia as the primary element of the affection, while the former holds it to be a consequence of the deterioration of nutrition produced by nervous derangement. Probably the condition of

the blood and that of the nervous system are so closely associated that one cannot be impaired without injury to the other; yet, taking the cases of M. Beau as evidence, the latter would appear to be the first affected, as M. Trousseau maintains. Such a conclusion is arrived at by Prof. Laycock in a paper, the essential portion of which is reprinted in the present number of this Journal. It may be remarked that M. Trousseau declares no benefit is to be derived from the use of iron in this affection, but, on the contrary, that it aggravates the symptoms; that according to him iodine will equally exasperate them; and that the most successful remedy is digitalis associated with such measures as are adapted to restore the suppressed menses.

The paper on "Fatty Degeneration of the Heart," particularly as a cause of sudden death, is peculiarly interesting from its containing an account of the sudden death of two great illustrations of Scottish literature and science, Dr. Chalmers and Dr. Abercrombie, who both fell victims to this disease. The essay on "Erysipelas" contains, we believe, one of the earliest evidences of the efficacy of muriated tincture of iron in this affection, although the author associated with it other remedies which he would probably, at this day, consider superfluous if not injurious. In like manner, Dr. Begbie appears to have seized the just idea of a pathology of "Diphtheria and its Sequels," when he contends for its being a toxæmic disease, and not a local inflammation. His essay on the "Therapeutical Effects of Arsenic" is one of the wisest that has been published in regard to this powerful agent; and although it does not profess to furnish any novel results, it tends to rationalize our use of the remedy, by showing the common elements belonging to the diseases which it is adapted to cure. The employment which he recommends of it in chronic bowel complaints is worthy of the attention of our physicians who have the care of patients affected with these disorders contracted during the hardships and complicated sicknesses of camp life. A paper "On the Sedative Powers of the Datura Stramonium" closes the volume. It may serve to recall the earlier results of its use in neuralgic and rheumatic affections.

In conclusion, we can only repeat the expression of high appreciation which we entertain of these essays, stamped on every page with marks of the author's thoroughly sound sense, and of his acute perception of the essential elements of certain diseases, and of those which they possess in common with others, which, at first sight, contrast with, more than they resemble them.

A. S.

BIBLIOGRAPHICAL NOTICES.

ART. XV.—*A Practical Treatise on Fractures and Dislocations.* By FRANK HASTINGS HAMILTON, A. B., A. M., M. D., Lt. Col.; Medical Inspector U. S. A.; Professor of Military Surgery and Hygiene, and of Fractures and Dislocations in Bellevue Hospital Medical College; one of the Surgeons to Bellevue Hospital, New York; Professor of Military Surgery, etc. in the Long Island College Hospital, Brooklyn; Author of a Treatise on Military Surgery. Second edition, revised and improved. Illustrated with two hundred and eighty-five woodcuts. Philadelphia: Blanchard & Lea, 1863.

IT gives us sincere pleasure to call attention to the issue of a second edition, so soon after the publication of the first, of this excellent treatise of Dr. Hamilton. We esteem it to be one of the best of our native medical works, one of which the profession of this country may be proud, and it would seem that the profession here as well as the reviewers abroad fully appreciate its merits.

The present edition has been most carefully revised; some portions have been amended, some paragraphs have been excluded, and considerable additions have been made, rendering it, as the author desired, "a faithful record of the progress of that branch of surgical science of which it treats." As the work has been placed upon the United States Army Supply Table for Post and General Hospitals, and, moreover, information on the subject being generally demanded at the present time, a new chapter, on "Gunshot Fractures," has been added.

There are but very few portions of this book which are at all obnoxious to criticism; and these we shall point out.

The first chapter in Part II., on Dislocations, entitled "General Considerations," is much too meagre. The section on the pathology of these lesions is one we might point out, particularly, as not affording the information necessary for understanding the condition of the parts concerned, in recent and in old dislocations. This condition of the parts has been well studied and carefully described, and far from being a matter merely of interesting speculation, it is second to none other in practical importance, as by its knowledge alone can the surgeon determine what he is called upon to perform, and how and when it is best for him to proceed.

In the chapter on Tarsal Luxations, when treating of dislocations of the astragalus, the only mention made of section of the tendons, which offer the chief impediment to the restoration of the bone to its normal position, is this: that Mr. Erichsen suggests in case of a failure by the ordinary means, we should resort to a subcutaneous section of the tendo-Achillis. The study of a paper by Mr. George Pollock, in vol. xlii. of the *Medico-Chirurgical Transactions* (1859), would induce Dr. Hamilton to add considerably to what he has said on this important point.

The newly added chapter on Gunshot Fractures is but four pages in length. This is evidently much too brief, and consequently, though there is not one sin of commission therein, there are very many of omission. We felt greatly disappointed on finding this chapter so meagre, for to no one would we look with more confidence than to Dr. Hamilton for information in regard to gunshot fractures. His recent extensive personal experience as a military surgeon, and the study of the specimens in the army medical museum, added to his previous researches and knowledge of the literature of the subject have surely enabled him to give the profession something more than what every member of it should already have known.

We feel called upon to express our admiration of the manner in which the publishers of this work have again performed their task. The paper, the printing, and the illustrations of this large volume are truly admirable.

W. F. A.

ART. XVI.—*Catalogue of the Army Medical Museum, Surgeon-General's Office, Washington, D. C., January* 1, 1863. Washington: Government Printing-Office, 1863. 8vo. pp. 58.

THIS catalogue contains a list of the objects collected up to the beginning of the present year, for the purpose of preservation in the Army Medical Museum of the United States, established last August by the Surgeon-General, William A. Hammond. Thirteen hundred and forty-nine objects are herein recorded, comprehending not only surgical and medical pathological specimens, but also the missiles by which injuries are inflicted in war.

Of these specimens, nine hundred and eighty-five are surgical, one hundred and six are medical, and one hundred and thirty-three are missiles, the greater number of which have been extracted from the body. An interesting portion of the collection is a series of projectiles for small arms, field and heavy guns; and also a complete set of the bayonets now in use in our own and foreign services. For this important addition to the Museum, prepared at the Washington Arsenal, Dr. Brinton, the curator, expresses his indebtedness to Lieut. Col. Geo. D. Ramsay, of the ordnance department of the army.

Each one of these objects has been appropriately and permanently mounted; the dried preparations on stands, and the wet in glass anatomical jars, of the most approved patterns, and constructed for the purpose. We feel ourselves entitled, from personal observation, to speak of the manner in which these preparations have been made, as manifesting the most admirable skill and carefulness. A label is attached, on which is inscribed its catalogue number and the name and rank of the medical officer from whom it was received.

In the catalogue now before us, which has been prepared by Dr. Wm. Moss, Assistant Surgeon U. S. A., a brief description of every object is given, and on the same line, in a separate column, its museum number and the name of the contributor. When a sufficient history has been received of a specimen, an asterisk is attached to the number. It will be noticed with regret that a large proportion of the numbers are not accompanied by this mark, and it is to be hoped that medical officers recognizing their contributions will exert themselves to supply this deficiency.

As no attempt has been made to classify the specimens in the museum, the object for the present being simply to collect and preserve, and as no general observations are made in the pamphlet before us, we can now do little more than call the attention of our readers to what has already been accomplished by the able hands to whom the Surgeon-General has committed the important task of forming an army medical museum. W. F. A.

ART. XVII.—*The Principles and Practice of Surgery, embracing Minor and Operative Surgery; with a Bibliographical Index of American Surgical Writers from the year* 1783 *to* 1860. *Arranged for the use of Students, and Illustrated by* 400 *Woodcuts and nearly* 1000 *Engravings on Steel.* By HENRY H. SMITH, M. D., Professor of Surgery in the University of Pennsylvania, &c. In two volumes. Philadelphia, J. B. Lippincott & Co., 1863. Octavo, pp. 826 and 769.

THE present volumes we are informed, in the preface, embrace the substance of the author's three treatises, on "Minor Surgery," on "Operative Surgery," and on the "Practice of Surgery." The whole of these three treatises, it is there stated, "*has* been carefully revised, a considerable portion rewritten, about five hundred pages of new matter added, and the work specially prepared to serve as a text-book or aid to those in attendance on surgical lectures."

From the just and comprehensive reviews of these several works published in this journal at the time of their appearance, its readers are acquainted with the treatises above enumerated. In his work of revising them and of re-writing portions, in the preparation of the two volumes before us, the author has stopped far short of such changes, both in style and in matter, as were required in a text-book for students. At the risk of appearing like the man in Hierocles, who carried a brick about with him as a sample of a house, we will present the following prescription as it was given in the first edition of the Practice of Surgery and as it is found now *revised*, assuring our readers that it fairly exemplifies the changes made throughout the work. There is some improvement, but it is by no means sufficient:—

"℞. Mentha piperita, origanum vulgare, rosmarinus officinalis, salvia officinalis, thymus vulgaris, flores lavandula vera, āā ʒij; vini rubri (claret), Oij. Mix, and let it stand fifteen days."—*Treatise on the Practice*, &c., p. 118.

"℞. Menthæ piperitæ, origani vulgaris, rosmarinus officinalis, salviæ officinalis, thymus vulgaris, flores lavandula vera, āā ʒij; vini rubri (claret), Oij. Mix, and let it stand fifteen days."—*The Principles and Practice*, &c., vol. i. p. 261.

The additions that have been made to the present work, we regret extremely to say, are not found where they were most needed. There is, for example, a chapter, or rather a section of a chapter, on pyemia in the *Treatise on the Practice of Surgery*, where the whole of this subject, than which there is none more important, is treated of in less than eighty lines.

To this section nothing has been added in the present volumes, and we still read the extraordinary statement which is intended as a reason for this, that this "disease, though of frequent occurrence in the hospitals of Europe, is not common in the United States, and therefore merely requires this brief allusion."

The student who relies upon the work before us for information in regard to what awaits him in his future career, and for ability to recognize and encounter the difficulties of the practice of surgery, will find himself most sadly disappointed.

The volumes are so profusely illustrated, that the work might be styled the *Pictorial Practice and Principles of Surgery*. W. F. A.

Art. XVIII.—*Reports of American Hospitals for the Insane.*

1. *Of the Massachusetts State Hospital, at Taunton, for the year* 1861.
2. *Of the Butler Hospital, for the year* 1861.
3. *Of the Retreat for the Insane, for the fiscal year* 1861–62.
4. *Of the Vermont Asylum, for the fiscal year* 1861–62.

There is great diversity in the corporate title of our establishments for the treatment of mental alienation. We have Lunatic Hospitals and Lunatic Asylums. We have Insane Hospitals and Hospitals for the Insane. We have Insane Asylums and Asylums for the Insane. We have a Retreat for the Insane and an Asylum for the Relief of Persons deprived of the Use of their Reason, the latter title going all about the country to avoid what was formerly considered a stumbling-stone, but which is a stumbling-stone no longer; and, finally, we have a Bloomingdale Asylum, a Long View Asylum, a Maryland Hospital and a Mount Hope Institution, each without any prefix or appendix indicative of the special purpose of the establishment to which it belongs.

In consideration of these differences we have heretofore, in the title of the articles in which we have reviewed the reports of these establishments, employed the word "Institutions," that being a generic term comprehending all the titles aforementioned. We have now discarded that word and use "Hospitals" in its stead. This, by some, may be thought a small matter, and unworthy of the paper and ink which we have already expended upon it. We do *not* so consider it, but believe it worthy of still further consideration.

There is general uniformity in the objects of our several establishments for the Insane. Whatever might have been the original character and purpose, whether curative, or simply care-taking, or custodial, they have become, in the progress of time, *curative*. They are, therefore, essentially *Hospitals*. Hence, we think they should be called *Hospitals*, and that such should be their legal title, and not Asylums, Retreats, or Institutions.

But this is not enough. They should have a specific or discriminative title, to prevent misunderstanding or the confounding of them with hospitals for other purposes. By what term shall the discrimination be made? The word "Lunatic," employed in its original and philological signification, is simply incorrect. It conveys a false idea. Let us abolish the use of it *in toto*. The word "Insane" falls more agreeably upon the ear, and it has the pre-eminent advantage of truthfulness, as applied to the hospitals in question. We now have our principal terms. In what relation to each other shall we place them? Shall we say Insane Hospital, or Hospital for the Insane? The former expression has the advantage of brevity, of compactness, but it falls—it has always fallen—disagreeably upon our ears, and we rarely, if ever, either hear it or read it, without feeling disposed to exclaim, "Insane Hospital! Why, a hospital can't be insane!" The title "Lying-in Hospital" sounds sufficiently appropriate, although hospitals have not fallen into the habit of lying-in. "Smallpox Hospital" sounds well enough, even though hospitals require no vaccination to procure exemption from variola; and so also "Syphilitic Hospital." Not so with "Insane Hospital." But whence the difference? Probably from the fact that the words "Lying-in," "Smallpox," and "Syphilitic," signify, the first a corporeal condition, and the last two, corporeal, or physical diseases, diseases of *matter*, and the incongruity of applying them by grammatical construction to other matter than that to which they are strictly appropriate, is not so manifest as to appear absurd; while the word "Insane" implies mind, intellect, intelligence; it is properly used in a psychological sense alone, and hence if it be, even only by grammatical construction, applied to brute matter, to a hospital, the impropriety instantly becomes annoyingly evident. Hence, we reject the title "Insane Hospital" and fall back upon the only appropriate one—"Hospital for the Insane."

It is to be hoped that the time will come when, for the sake of uniformity, for the sake of propriety and truthfulness, and for the sake of that advantage which the change would yield by conveying less unpleasant impressions, this title will be universally adopted. So important do we consider this subject, that we would suggest to the members of the Association of Medical Superintendents of American Institutions (Hospitals?) for the Insane, to petition the State Legislatures upon it, or to take some other measures, if others are better adapted to the end in view, whereby the change may be effected.

We are not the first to broach this subject. Dr. Kirkbride gave his views upon it in his report for 1858; and as he made it still more comprehensive than we have, some extracts from his argument will add force to that which we have written.

"The *nomenclature* formerly applied to insanity, and to establishments for its treatment, and unfortunately not yet entirely given up, is far behind the age, and has done more harm in influencing men's minds in reference to both, than is generally supposed. In the days when 'cells' and 'keepers' were spoken of, the natural inference was that they belonged to prisons, for these are prison terms. Even now, it occasionally happens that such terms are heard from individuals who, themselves, often occupy smaller apartments, more inconveniently located, more poorly warmed, ventilated and lighted, and not better furnished, and yet who would seem greatly surprised if asked whether they had comfortable 'cells' in the fourth or fifth story of their hotel or boarding-house. There is no reason for thus designating the better of two chambers, that would not apply to the poorer of the two; nor should a nurse and companion of an insane person be styled a 'keeper' any more than if having the care of a case of ordinary sickness.

"So of the institutions themselves; if they are for the treatment of disease, they should be called 'hospitals.' * * * * * This institution having at its

commencement been as far wrong in reference to a title as any other, and having made the change, I have no hesitation in speaking of the good results which have followed. The early drawings of this building will show that it was first styled the 'Lunatic Asylum of the Pennsylvania Hospital,' but before it was opened, the name was very properly changed to that which it now has, 'The Pennsylvania Hospital for the Insane.' The State Institution at Harrisburg also modified its title for the better, but it only did one-half the work. Originally named in the law establishing it, 'The Pennsylvania State Lunatic Hospital and Union Asylum for the Insane,' it dispensed with the latter part of its very awkward title, but unfortunately retained the term 'lunatic,' which, of all terms is the most obnoxious to patients, and one of the most unfortunate and irrational that can be applied to such establishments or to a case of insanity. * * *

"'Asylums,' or 'Retreats,' places of refuge or security, are not provided for the treatment of fever, or rheumatism, or other diseases, nor should the institutions for the treatment of insanity be so called."

We proceed to an examination of the reports—

1. The proposition, in a former report, by Dr. Choate, of the *Massachusetts State Lunatic Hospital*, at Taunton, to limit the number of patients at that institution to four hundred, has not, as will be perceived by a perusal of the following statistics, been acceded to.

	Men.	Women.	Total.
Patients, September 30, 1860	190	171	361
Admitted in course of the year	131	121	252
Whole number	321	292	613
Discharged, including deaths	111	91	202
Remaining, September 30, 1861	210	201	411
Of those discharged, there were cured	68	51	119
Died	27	25	52

Died of phthisis, 12; maniacal exhaustion, 7; marasmus, 5; apoplexy, 4; chronic mania, 4; anæmia, 3; paralysis, 3; softening of the brain, 3; disease of the heart, 2; diarrhœa, 2; fever, 1; old age, 1; gangrene, 1; disease of the liver, 1; erysipelas, 1; epilepsy, 1; pneumonia, 1.

In his remarks upon the curability of insanity, Dr. C. mentions the following as established facts:—

1. "The inhabitants of large cities afford a smaller proportion of cures than those residing in the country."

2. "Previous habits of intemperance and dissipation, by breaking down the constitution, diminish the hopes of effecting a cure."

3. "In this country, disease occurring in those who have emigrated from foreign lands to our shores, is more likely to be beyond the reach of remedial treatment."

The two subjoined extracts from the report, one upon the prevention of insanity, the other upon its causes as exhibited in the patients admitted in the course of the year, and in the former of which direct allusion is made to the latter, are worthy of very attentive perusal.

"The inculcation of wise counsels among the people as to modes of living, the diffusion of more correct views as to the causes of insanity, and the rules to be thence deduced as to the best means of avoiding it, can alone be relied upon to diminish this wide-spread and growing evil. In the proper place it will be shown in this as in former reports, how large a proportion of the whole number of cases admitted have been brought upon the sufferers by causes over which they had entire control; how many are due to foolish and unsatisfactory and criminal indulgences; how many to habits of life in some respects praiseworthy, but in their relation to the physical and mental health to be condemned and avoided; in short how great a diminution might be brought about in the number afflicted with this scourge, were only the true rules of life and health fully understood and obeyed throughout the community.

"At the present time especially, when new and powerful sources of mental excitement are being presented to the minds of our fellow-citizens, and when the

deprivations and disturbances and anxieties of war are adding new causes of mental derangement before unfelt in our midst, does it become us to endeavour by every means in our power to urge an obedience to those laws of nature, which are seldom violated without the exaction of nature's penalty. That there is something wrong in the system of education of the present day, in the luxurious modes of living, in the eagerness with which exciting scenes and thoughts are sought, and in the hazardous and venturesome method of conducting most forms of trade and business, is not a mere matter of speculative remark or curious inquiry, but is a fact fraught with momentous consequences to the moral and mental health of the community. The premature and overstrained employment of the mental powers on the one hand, and the neglect on the other of moral discipline, and of that education which inculcates proper principles of feeling and action, and teaches the restraint and command of temper, emotions and moral affections, are undoubtedly among the most deeply laid foundations of insanity. And upon these are too often raised the structure of incurable disease by unbridled indulgence of the passions, or by a plunge into some of the fashionable excitements of society, or by an entrance upon some speculative and risky method of business, with its necessary attendants of alternate excitement and depression, of elated expectations and painful anxieties, of intoxicating hopes and depressing fears, of glowing anticipations and chilling disappointments. To a reformed and more enlightened system of education, to greater simplicity of living, and a more strict obedience to the moral law, and to a more safe and rational and limited method of business must we look for aid in diminishing the pressure upon the halls of our lunatic asylums." * * * * * * * * *

"I will barely call attention at the present time to a few of the most prominent and potent causes on the list. Intemperance, as usual, stands at the head, and has been the acknowledged cause in more than one-fifth of all the cases admitted into the institution since its opening, where the cause was known. Ill-health, which, in a large majority of cases, covers up some radical defect in the habits of life, and is merely a penalty exacted for some offence against nature's laws, is chargeable with another fifth. Indulgence in the lower appetites and passions, too deep absorption in some of the fashionable excitements of society, and a want of care for the preservation of the health, particularly in females at seasons when their systems are peculiarly susceptible to the access of disease, have been assigned as the exciting causes in more than another fifth. These combined causes, which are with few exceptions self-induced, constitute the sources of disease in nearly eighty per cent. of all the cases. It would seem, that such truths as these needed only to be generally known, in order to lead the community to avoid the causes which produce so large a proportion of the cases of this terrible disease. But when sins and vices and neglects operate very gradually, and apparently upon only a portion of those practising them, too many lay the flattering unction to their souls that they shall escape. In nothing more strikingly than in the care of and regard for human health is illustrated the truth of the words of the sacred writer, that 'because sentence against an evil work is not executed speedily, therefore the heart of the sons of men is fully set in them to do evil.' One new cause appears in the table of this year, the excitement of the camp, with its sudden change in the mode of life, its exposures, its privations, and not least, it is to be feared, its excesses and indulgences. To this cause are due the disorders of three young men recently admitted, the youngest of whom is a slender youth of barely sixteen years."

We make some selections from the remarks upon *moral treatment*. It would appear, from one of them, that although the popular excitement attendant upon a state of warfare acts as a cause of mental disorder, it has also some influence as a curative agent.

"Mildness, kindness, and the abolition of all unnecessary restraint, continue to be the ruling principles. No mechanical restraint of any description is used except the camisole, which, very rarely in males, and not frequently in females, is made use of to secure from suicide, to prevent denuding of the person, and to protect the patient herself and those about her from injury.

"Ample reading matter has been furnished to all the inmates who desired it, from the library, which has been considerably increased during the year by the

addition of modern publications, and by the free daily distribution of newspapers.

"The little community here have shared with that outside its walls in the excitements incident to the eventful year which is upon us. That excitement has been with us in the main a healthy one, arousing some from a torpid state of indifference or melancholy, and calling off the thoughts of others from the unhealthy channels where they were wont to roam.

"The usual recreations of riding, walking, bowling, billiards, social parties, picnics, and games and evening entertainments, have been followed up with at least as much zeal as in former years. A singing school has been kept through eight months of the year, with very excellent effect, both as a means of amusement and as a healing agent.

"I should be wanting alike to my feelings and my duty, did I omit to acknowledge with thanks the efforts of many of the convalescent patients to maintain the good order of the institution, to aid in administering comfort to the helpless, and to assist in the domestic work of the household. A large part of the duties of the kitchen, the laundry, and the sewing department, has as usual been most satisfactorily performed by the female patients, while the men have contributed largely to the labour of the farm, the care of the stock, the improvement of the grounds, and the repairs and painting of the buildings and fences."

We shall close our notice of this interesting report by two extracts, one upon the completeness of cures, and the other conveying some information in regard to the impressions made by hospital life upon some of the patients, and both of them calculated to remove erroneous notions of somewhat extensive prevalence.

"A large proportion of all the cures which are effected are not only complete, but permanent, and the individual becomes again as well fitted for the active business of life as he would be after going successfully through any other physical disease."

"During the past, as in previous years, we have had many visits, most agreeable and grateful in their character, from recovered patients; and it may be mentioned as a fact worthy of record, that in three instances former patients came voluntarily and delivered themselves up, feeling within themselves the necessity of a renewal of hospital treatment and hospital care.

"Although the deprivation of liberty to a certain extent must always, especially to the convalescent, be somewhat irksome and tedious, yet the instances are very rare where patients who have been discharged recovered, do not ever after cherish a grateful sense of obligation to the hospital, and keep up a lively feeling of interest in its welfare. In repeated instances in the past as in previous years, patients whose convalescence was fully established, but who had no strong ties of family, or home, or business, to call them away, have expressed a reluctance to leave its friendly shelter."

2. The result of treatment at the *Butler Hospital for the Insane* for the year 1861, are expressed in the following numbers:—

	Men.	Women.	Total.
Patients at the beginning of the year . .	68	59	127
Admitted in course of the year . . .	25	28	53
Whole number	93	87	180
Discharged, including deaths	23	22	45
Remaining at the end of the year . . .	70	65	135
Of those discharged, there were cured . .			22
Died			14

The diseases which proved fatal are not mentioned.

Instead of entering into the details found in most of the reports, Dr. Ray continues his usual practice of presenting an essay upon some topic connected with the general subject of mental disorders. The subject this year is taken from the broad field of medical jurisprudence.

After having described the change which, in the current century, has been effected in our courts, by the more enlightened views of insanity, he says—

"Notwithstanding the advance thus indicated, it is none the less true that many of our laws and legal practices respecting the insane do not correctly reflect the present state of our knowledge concerning their disease."

One of the subjects upon which the existing laws do not adequately meet the exigencies, is the disposition of persons who have been acquitted on the ground of insanity, of alleged crime. This he discusses at length, premising that the persons to whom the discussion is particularly devoted may be divided into three classes, as follows:—

1. "Those who, at the time of trial, are supposed to have recovered from the disease which led to the offence."

2. "Those who differ from the last in the single particular that they have had previous attacks, and will probably have another at no distant period."

3. "Those who remain insane at the trial, with more or less probability of recovery."

"These classes embrace the various conditions to be provided for, and they must, one and all, be duly recognized in any legislative enactment on the subject."

The discussion is so long as to prohibit us from the reproduction of it *in extenso*, and so *sequential* as to render an abridgment unsatisfactory. We must content ourselves and our readers with the author's *conclusions*. They are as follows:—

"The ground of the acquittal being stated by the jury, the court shall commit the prisoner to the prison or county jail.

"Whenever the liberation of such a person shall be claimed on the ground of recovery, the court shall appoint a commission to make inquiry into this fact; and if satisfied by their report that recovery has taken place, the court shall order his discharge.

"If the person thus recovered shall have had a previous attack, he shall be discharged, on condition that his friends recognize in a suitable obligation for his good behaviour.

"If at any time the court shall be satisfied by the report of a commission appointed for the purpose, that the person, though still insane, has become harmless in consequence of some change in the form of his insanity, or the occurrence of bodily infirmity, it shall consign him to the custody of his friends on the same terms as the last mentioned.

"If in the opinion of the court at the time of trial, or at any subsequent period, the person's recovery would be promoted by being confined in a hospital for the insane rather than the jail, and no important point compromised thereby, it shall signify this opinion to the Governor, who shall be authorized to carry it into execution.

"Thus, all possible exigencies are provided for, not, however, without leaving much to the discretion of the court. This is unavoidable, and in no better hands can such discretion be left than the judicial."

In the course of the discussion, the objections to a commitment to the hospitals for the insane of persons acquitted of criminal acts on the ground of insanity, are thus set forth:—

"Since establishments for the insane have grown into public favour, they seem, as a matter of course, to be regarded as the more suitable place for this class of persons—as if the insanity were the only element in the case worth notice, all others, and especially the social consideration, being quite overlooked. To those practically acquainted with the working of hospitals for the insane, it has long been apparent that the greater part of these people make very unsuitable inmates. Many of them, it must be borne in mind, are essentially criminal—men of the baser sort not improved at all by the incident of insanity. Their companionship can be salutary to none, and must be positively disagreeable to many, for it must be borne in mind that the insane are not entirely devoid of moral sensibilities. Their influence is decidedly bad, in a place where, of all places, the surrounding influences should be decidedly good. The ends to which all modern improvements in the management of the insane have been tending, are to create a high moral tone throughout all their relations to others, to free our hospitals from every repulsive feature, and make them agreeable places of

abode. Especially, has it been thought desirable to banish, to the utmost practicable extent, whatever is calculated to suggest in the mind of the unhappy sufferer, the idea of crime, of punishment, of convicts. Certainly, nothing can be better fitted to defeat these ends than this intimate association between the ordinary insane and those who have been committed for criminal offences. No one who has had charge of a hospital into which the latter have been admitted, can have failed to perceive the irritation and the mischief constantly resulting from this source.

"The effect upon these persons themselves is generally bad. Their history soon becomes known to the other patients; they are looked upon with no favourable eye, and on every little collision, they are reminded in terms more emphatic than courteous, that they are no better than they should be. To none can such relations be very conducive to recovery, and to those who, otherwise correct and exemplary, have, in a paroxysm of disease, been unfortunately impelled to commit some dreadful deed, they must constitute an additional ingredient of bitterness in their bitter cup."

This subject concluded, the author proceeds to a commentary upon a legal practice which, so far as our knowledge extends, has hitherto escaped the animadversions in their printed reports of the superintendents of our hospitals for the insane, but of the evils of which we have but too often been the saddened witness. As the subject is important, new in our notices, and, as we think, interesting to our readers, we shall quote liberally.

"No more fitting opportunity could offer to call your attention to one operation of law, which produces much embarrassment to us and annoyance to those who are its objects. I refer to the matter of guardianship—a measure often necessary to secure the interests of the insane. Whenever a proper application is made, the Court of Probate, to whose jurisdiction the matter belongs, issues its writ directing an officer of the court to notify the parties concerned. He makes his appearance here, is introduced to the patient, draws out a formidable looking paper, and reads it from beginning to end. In this document the patient is told, with no arts of circumlocution, that he is a lunatic; that certain persons have applied to the court for the appointment of a guardian of his person and property; and that he may appear, if he see fit, at a specified time and place, and show cause, if any he have, why the appointment should not be made. Now, this is a very simple and intelligible thing, and the man should be thankful for the paternal interest thus manifested by the law in his affairs. And most certainly he would, if this lunatic, as he is called, would but take a reasonable view of the case. But in all seriousness, I do not hesitate to say, that if any more effectual means can be devised for awakening the suspicions and alarms of a patient, for rekindling the smouldering flames of excitement, and thus arresting the course of any restorative process, I know not what it is. On no description of patients, except the raving and demented, who would neither understand nor care about the measure, can its effects be otherwise than bad. There is no more common trait of insanity than a fixed belief that the patient is the object of hostility, annoyance or opposition, in some shape or other. Whatever form the feeling may take, it is invariably exaggerated, and sometimes to an alarming extent, by such a scene as I have described above. If the hostility is attributed to particular individuals, the patient refers the measure to them, who, as he conceives, not satisfied with getting possession of his person and thrusting him into a prison, complete their malignant work by stealing his property. If the feeling consists in a vague sense of opposition and difficulty, pressing upon him from every side and crushing him to the earth, the measure comes as confirmatory proof of the presence and power of the adverse influence, and furnishes fresh occasion for the most poignant distress. Another, who believes he has been arrested in the midst of the wisest plans, and regards his confinement, therefore, as an act of gross injustice, must necessarily be enraged to find that this injustice has been consummated by stripping him of all his property. Another, whose mind is entirely loosed from its propriety, and borne about by every wind of morbid fancy, finds in the proceeding only a fresh stimulus of excitement and extravagance.

"The whole proceeding is contrary to the principles and practice that charac-

terize the modern management of the insane. They do not, generally, believe themselves to be insane; and though we who mingle with them frankly express our own convictions on this point whenever it cannot be avoided, yet we are careful never to thrust the unpleasant fact in their faces. A certain delicacy and reserve on this point will characterize all humane and skilful dealing with the insane. But here, in this proceeding, the patient is summoned into the presence of a stranger who tells him in the most uncompromising terms, that he is a lunatic, and that somebody is endeavouring to obtain the control of his affairs. Is it strange that this declaration, thus unceremoniously made, should shock him beyond endurance? Our experience in this line, during the past year, has been peculiarly unfortunate. In two patients, the reading of the notice raised a storm of excitement which, in one of them, continued for several months, converting him into a violent, dangerous man, and as such, of course, subjected to many restrictions and deprived of many privileges. In two other cases, I undertook to prepare the mind of the patient, by urging, as skilfully as possible, the propriety of the measure. The result was, that one, five minutes afterwards, endeavoured to commit suicide, and the other, in the course of the day, attempted to elope while walking out—both giving, as the reason for their conduct, the communication I had made. These are but specimens drawn from a single year's experience of the serious mischief produced by this mode of procedure, and it becomes a very important question to ask, whether it is really necessary and unavoidable."

After meeting and answering the arguments of the courts in favour of the objectionable practice, the author says:—

"If these views are correct, then every proper purpose would be answered, and all mischief avoided, by providing in the statute, that, no objection being made, the court may dispense with the reading of the notice when satisfied by the testimony of some competent medical man, that such reading would, probably, be detrimental to the mental condition of the party concerned. Such a provision, let me repeat, would save us from much embarrassment; it would relieve the immediate friends of the insane from great inconvenience; it would promote the pecuniary interest of the patient whose affairs may need constant supervision and control; it would prove beneficial to all concerned, and injurious to none."

3. Dr. Butler's report, for the fiscal year 1861–62, of the *Retreat for the Insane*, begins with a tabular statement, from which we copy our customary items.

	Men.	Women.	Total.
Patients, March 31, 1861	109	117	226
Admitted in course of the year	79	92	171
Whole number	188	209	397
Discharged, including deaths	83	93	176
Remaining, March 31, 1862	105	116	221
Of those discharged, there were cured . .	29	42	71
Died	7	10	17

Died from general debility, 3; exhaustion, 3; epilepsy, 2; exhaustion of acute mania, diarrhœa, apoplexy, gangrene, inflammatory rheumatism, suicide, disease of the liver, disease of the brain, disease of the heart, 1 each.

"We should be at a great loss in our method of treatment," says this report, "without the aid of our new Amusement Hall. Our entertainments there are so efficient in diverting the mind from painful reflections; they so effectually dispel the thickly coming fancies which shadow the weary hours of anxious doubt and fear; they cheer by that true, earnest sympathy which ever beckons us all on from doubt to hope, that it is no exaggeration to class them among our most efficient remedies.

"Our dancing, musical, and other parties, with exhibitions of our new and improved magic lantern, have been continued through the winter. The additions to the magic lantern apparatus have proved very valuable, rendering it an efficient means of amusement."

In the course of the past year two buildings have been erected, one of them a museum, at an expense of nearly twenty-seven hundred dollars, the other a bowling alley for the women patients, at a cost of more than sixteen hundred dollars. Upwards of five thousand and four hundred dollars has been expended in grading, laying out, and otherwise improving the grounds, and six hundred and sixty-five dollars have been devoted to the purchase of musical instruments, books, pictures, furniture, and contingent expenses. All these sums were raised by voluntary contribution. "Progress" appears to be the watchword at Hartford.

4. From the report of the *Vermont Asylum for the Insane*, it appears that the additional story to the wings adjoining the central building of that hospital which was in progress at the date of the report for 1861, has been completed, adding nearly one hundred rooms to the establishment, and increasing the facilities for a proper classification of the patients.

	Men.	Women.	Total.
Patients in hospital, August 1st, 1861 . .	230	208	438
Admitted in course of the year	71	75	146
Whole number	301	283	584
Discharged, including deaths	69	52	121
Remaining, August 1st, 1862	232	231	463
Of those discharged, there were cured . .			47
Died			42

"One great source of novelty and entertainment to the patients," says Dr. Rockwell, "is the various manifestations of ideas by other patients. Those whose minds are not too imbecile or demented, easily perceive the insane notions of the other inmates. By this means their minds are diverted from their own delusions, and they begin to distrust their own fancies, and a commencement is made towards their recovery. It is supposed by some that the wild notions of the insane in a lunatic asylum would rather retard than accelerate the recovery of the rest. This is not the case where the inmates are judiciously classified.

"Many of the patients have received benefit by administering to the wants and comfort of their fellow inmates. We always encourage these acts of benevolence, as beneficial to both the giver and receiver."

With upwards of four hundred patients, already within its walls, this establishment is still further enlarged by the addition of nearly one hundred rooms. No such enlargement would, of course, have been made without an expectation of increasing the number of patients. This is another illustration of the practical operation of the proposition, *unanimously* adopted by the Association of Superintendents of American Institutes for the Insane, which declares that no hospital should contain more than two hundred and fifty patients. P. E.

ART. XIX.—*Report of the Board of Health of the City and Port of Philadelphia to the Mayor, for* 1862. 8vo. pp. 49.

WE have examined with care the report before us, expecting to derive from it some definite idea of the sanitary condition of the city of Philadelphia during the past year—the sources of whatever actual disease may have prevailed within its borders, the possibility of their removal, and the measures best adapted to attain that end. We have, we must confess, been disappointed; the report being neither so full nor so particular as might have been anticipated, considering the importance of the subjects discussed in it, and the known talents embraced in the Board from whence it emanated.

The report informs us, it is true, that the general sanitary condition of the city during the year 1862 was very good; that there occurred no epidemic of an infectious or contagious character, with the exception of smallpox which

prevailed during the early part of the year, though to a less extent than in 1861. So far very good, more especially as from the detailed account given in the appendix of the deaths which occurred in each month of the year with their respective causes, compared with the population, and the general summary of the registry of marriages and births furnished by the Health Officer, we can arrive at a very fair and tolerably exact judgment of the true sanitary condition of the city.

With respect to the sources of disease which exist within the city limits, we are led to infer that they consist chiefly in filthy streets, sewers, yards, and dwellings; in foul, leaky, and badly constructed privies; in stagnant water in yards, cellars, and open lots; in hog-pens, cow-stables, slaughter-houses, and offensive manufactories located in crowded localities; in intermural interments, and, with respect to one district (Kensington), in the impurity of the water supplied for domestic purposes. No data, however, are furnished from which to form even an approximative estimate of the extent to which these nuisances severally prevail, or to arrive at any satisfactory judgment as to the means best adapted for their prompt and effectual abatement and to guard against their recurrence in the future.

The leading and most important object aimed at in the organization of the Board of Health is the prevention of disease in our midst, by guarding against the introduction of any of its causes from without, and, by removing such of these as may exist at home. In carrying out, more especially that portion of its duty which refers to the removal of all domestic sources of disease, the Board must necessarily have confided to it a general supervision of the condition of the air which the citizens breathe, and of the water which they drink or make use of for culinary purposes, and of all the various causes by which the purity of the air and water of the city may be impaired, or rendered unfit for the preservation of the system in a healthy condition. Still better would the Board be enabled to fulfil its sanitary mission were to it also confided the control of the food and clothing of the people; the structure, location and police of the private dwellings and public halls; of schools, churches, lecture rooms and manufactories.

In Philadelphia there exist some very prominent defects in the sanitary police of the city, for the amendment of which the influence of the Board of Health should be constantly and prominently directed.

The entire system of drainage in Philadelphia is defective. There is far too limited an extent of sewerage, considering the flatness of a large portion of the surface of the city. The consequence is that, in many neighbourhoods, yards and cellars are flooded in times of heavy rains or freshets, while in ordinary seasons the waste water from our dwellings and workshops becomes converted, in the gutters, into an offensive mass, of too great density to permit its flowing freely towards the rivers or into the inlets of the sewers, and requiring to be washed out daily by broom and hose. Even much of the sewerage which exists in our city imperfectly fulfils its office of drainage and becomes often, itself, a nuisance of no trifling character. The fault has been that, as the city gradually extended its boundaries with its increase of population, and the need of an extension of underground drainage was in consequence demanded, instead of the few illy constructed sewers, deficient in the necessary grade and dimensions, being replaced by others of an improved plan, of ample capacity and adapted to admit of whatever future extensions should be called for, in too many instances, little else has been done than to put down branches connected with the original sewers, in the construction of which some of the simplest but most important principles in hydraulics have been ignored. We may, it is true, hope that, under the supervision of a Board of Surveyors such as we now have, some part of the evil entailed upon our city by its defective sewerage may be remedied. It is the duty of the Board of Health to aid in effecting an early movement in this direction by calling, from time to time, the attention of our city government to the evil effects upon the comfort and health of the community resulting from the past system of drainage, and the amelioration in regard to it which is the most loudly called for.

The report before us alludes in very general terms to the unwholesome condition of the water furnished by the Kensington reservoir; and, as we presume,

from the impossibility of furnishing a supply of pure water from that source, recommends the entire abandonment of the Kensington works. No notice is taken of the present condition of the water supply from the River Schuylkill, through the works at Fairmount, or the security there is of its continued purity in the future. We believe that, as yet, the water derived from the Schuylkill is well adapted for drinking and all domestic purposes, but there is just cause for fearing that, from causes now in existence and others which are being constantly superadded, its present purity is endangered, and that, if efficient measures are not promptly taken to prevent it, the Fairmount works will, after a few years, have to be abandoned. It is the duty of the Board of Health, as conservators of the public health, to keep a constant and strict eye upon everything calculated to impair the wholesomeness of the Schuylkill water, in order to its prevention, or if this be found impossible, to call the attention of the proper authorities to the necessity of providing in advance a sufficient supply of good water from other sources. The importance of an ample supply of pure water to insure the comfort and health of a large city like Philadelphia can only be fully appreciated when, from any cause, the supply is suspended. Recently developed facts render it extremely probable that some, at least, of the more widely spread and destructive of modern epidemics are propagated by the use of impure water.

Among the hygienic measures most conducive to the health of a community is cleanliness, personal, domestic, and public. Over the first two a Board of Health can exercise no direct influence except by encouraging a sufficient supply of water to every dwelling, and the establishment of bathing facilities for the poor and working classes. Over public cleanliness, however, it must have entire control. It is a perfect farce to intrust to a Board of Health the prevention of disease amid a community, by guarding against the occurrence of its causes, or, when these are present, by their prompt removal, and at the same time deprive it of the power of preventing the streets, lanes, courts, and alleys from becoming the receptacles of decomposable matters, the emanations from which, especially in warm damp weather, are continually poisoning the air of entire neighbourhoods.

To keep the streets and highways and passages of a well-paved city in a sufficiently clean condition would seem to be a very simple thing, and yet, it is one in which the corporate authorities of Philadelphia have completely failed, after expending, annually, in their unavailing efforts to accomplish it, large sums of money. Nothing short of a thorough cleansing of every street, lane, alley, and court, early every morning—from the close of April to the commencement of October—and once a week during the remaining months of the year, excepting, perhaps, when the highways are loaded with ice and snow, nothing less than this, we say, will suffice to secure the health and comfort of the community. To see that this is accomplished is the duty of the Board of Health, or if it be neglected by the department of the city to which it is intrusted, to have it done under the power conferred upon the Board to remove all nuisances prejudicial to the health of the community. While, at the same time, it should insist upon the most stringent regulations being enacted and rigidly enforced, to prevent ashes, dirt, kitchen garbage or any kind of offals or filth from being thrown into the streets at any time or under any pretence.

The same remarks may be made as to the duty and power of the Board of Health in respect to all other things which have a direct tendency to impair the healthfulness of the city. The duty necessarily devolves upon it of preventing the location or continuance within thickly populated districts, of slaughter houses, cow stables, pig-pens, manufactories of an objectionable character, of prohibiting the storage, in such localities, of putrescent materials; and of causing filthy and overcrowded dwellings to be cleansed and their populations reduced. Unless the Board possesses the power referred to, and exercise it with vigilance, it cannot be recognized as the conservator of the public health, inasmuch as some of the more prominent of the domestic sources of disease would be without its control.

The foregoing remarks have been suggested less by what is contained in the report before us, than by what it has failed to notice. We believe that the Board of Health of the City of Philadelphia is as efficient as that, perhaps, of any other

city, nor would we accuse it of any dereliction of duty in wielding the powers intrusted to it for the good of the community. We would merely suggest that a little more fulness and elaboration in its annual reports would contribute much to their interest and value, and do fuller justice to the efforts which the Board has made and is still making to improve permanently the sanitary condition of our city. The remark applies, however, more especially to the general report; we have less fault to find with the report of the Health Officer of the births, marriages, and deaths of 1862, contained in the appendix.

We shall close the present notice with an abstract of the report for 1862 of the Smallpox Hospital, under the charge of Dr. John Bell.

Between the 1st day of January and the beginning of September, 1862, there were received into the hospital, 63 cases of variola, and 61 of varioloid, making together 124 cases. Of the entire number of cases, 62 were in white males, and 40 in white females; 9 in black males, and 13 in black females. Fifteen of the cases were in volunteer soldiers belonging to the army of the United States. Thirty of the cases were received during the month of January; thirty-six in February; thirty-three in March; seventeen in April; twelve in May; three in June; five in July; and one in September.

Thus the increase in the number of cases received into the hospital during the month of December, 1861, noticed in the report of that year, continued during the first quarter of 1862. January of the latter year gave just double the number of cases to those received in the corresponding month of 1861. By the month of March, however, the epidemic had reached its height, and it rapidly declined during the following month, so that in the month of August not a single case was received, and only one in the early part of September.

"This," to use the words of the report, "has been the usual course of previous epidemics of smallpox; beginning in the latter part of summer, increasing in the fall months, reaching its maximum in mid-winter, declining in the spring, and disappearing by mid-summer. The destructive epidemic of 1823–4 pursued this course. In the one which has recently assailed us, the morbid agencies of a predisposing nature, whatever they may have been, were so intense as to have operated without undergoing any modification by season or by atmospherical extremes or modifications."

Of the 124 cases treated in the hospital, 21 terminated fatally, namely, 20 of variola, or 31.74 per cent., and one of varioloid, or 1.64 per cent. Sixteen of the deaths—11 males, 5 females—were in white patients, 5—all females—among the black. The proportionate mortality in the whites of both sexes, was 31.7 per cent. In the males it was 40 per cent., in the females 26.3 per cent. In the blacks of both sexes, the death rate was 23.5 per cent. Divided between the sexes, it was 0 for the males, and 40 per cent. for the females. The proportionate mortality in the two sexes of each color, was the very reverse of what it was in 1861. In the latter year the deaths of white males from variola was 24.33 per cent., while that of the white females was 42 per cent. The deaths among black males was 34.2, while among black females it was only 9 per cent.

Four hundred and sixty-one deaths from smallpox occurred in Philadelphia during 1862, including those in the hospital; showing a decrease in the mortality from the disease in 1861 of 729, or 61.26 per cent.

A correct history of the rise and spread of the variolous epidemic of the two or three past years, would be a document of great interest and value. By throwing light upon the origin of the disease, whether it be the result of a poison introduced in the persons or effects of those coming from abroad, or of some inscrutable, morbific change in the condition of the atmosphere, we should be led to some definite conclusion in respect to the proper plan to be pursued to protect, effectually, the community against its occurrence. But, whether it shall be decided by future investigation that in all cases variola is to be traced to a foreign source, or that it may occasionally result, independently of personal contagion or fomites, from certain morbific conditions of the atmosphere, we feel well convinced that the enforcement of a systematic and thorough vaccination and revaccination of the entire community will be found one of the most certain, if it be not the only certain means of protecting it from the invasion of smallpox.

D. F. C.

ART. XX.—*Address before the Philadelphia County Medical Society. Delivered February* 11, 1863. By ALFRED STILLÉ, M. D., at the close of his official term as President. Published by order of the Society. 8vo. pp. 20.

AMONG the vast number of addresses annually delivered before the several medical societies and other professional bodies throughout the United States, we occasionally meet with some which exhibit a striking contrast to the mass by their superiority in style, the greater originality in the topics embraced in them, and the ability with which these are discussed. In consequence of the taste and talent such addresses exhibit, they present strong claims to our notice. With these latter is to be ranked the address of Dr. Stillé. It is particularly appropriate to the occasion which called it forth, and descants in correct and elegant language on subjects in which every member of our profession has an interest.

The address commences with a brief notice of the leading objects of the Society before which it was delivered, the general character of its proceedings during the year that had just closed, and the means by which the interest and profitableness of its meetings are to be enhanced in the future, and a fuller attendance of its members secured. Dr. Stillé then refers to some of the leading causes which tend to lower the character of the physician for general learning as well as for sound and adequate professional knowledge. Reference is next made to the importance of medical organization as a means of union among physicians for the establishment and promotion of that fraternal goodwill and hearty co-operation without which our profession would become little better than a horde of ruffians, and the social edifice itself would crumble into the ruins of barbarism. A hasty glance is next taken of some of the requisites necessary to constitute a satisfactory course of public instruction, and the proper means for its successful prosecution.

These several topics are touched upon rather than developed. They are, nevertheless, handled in a manner so pleasing and withal so particularly suggestive, that we should have been induced to quote somewhat extensively from the author's remarks in respect to them had we not been restrained from a desire to present very fully the interesting remarks of Dr. Stillé on certain of the diseases to which the soldier is liable, and also by the necessity of restricting our notice within reasonable limits.

His connection with one of the large military hospitals in Philadelphia has furnished Dr. Stillé with an opportunity to become familiar with some of the forms of chronic disease most prevalent among soldiers. Of these in the latter part of his address he presents a clear and instructive sketch. The most common by far of the diseases referred to have been affections of the bowels. Commencing as diarrhœas, they assume afterwards more or less of a dysenteric form, and finally, in some cases present an intercurrence of typhoid fever. The patient's health becomes either permanently destroyed, or a very prolonged and vacillating convalescence ensues. Seldom is the patient's health so completely restored as to render a return to active service a prudent measure. Even in the most favourable cases the least excess of fatigue, a change of weather from dry to cold and damp, the slightest over-indulgence in food, particularly if crude and bulky, will endanger a renewal of the characteristic alvine discharges, and render a resumption of dietetic and medicinal treatment imperative. Dr. S. treated this form of disease with tannic acid, given in pilular form, in doses of three grains, with one-twentieth of a grain of sulphate of morphia three or four times a day. At the same time the strictest regulation of the patient's diet was requisite. Dr. S. confined his patients absolutely to bread or soda biscuit and milk. To this strict regimen he attributes whatever success in the cure of the disease he has obtained. Even, however, after the most perfect cures, he remarks, a state of intestinal susceptibility sometimes continues, which by very trifling errors of diet will be converted into active diarrhœa. In some cases the association of lime-water with milk, in the proportion of one-fourth or one-third,

has been manifestly useful. As improvement advanced, rice and farina were added to the patient's dietary. Dr. S. protests against the so-called unfermented bread which is used in some of the military hospitals, as an article of diet for the sick, in consequence of its insipidity, and unsavory and indigestible qualities. As it must be used on the day it is baked it becomes the frequent cause of bowel complaints, and always of their prolongation.

Dr. S. has not noticed ascites to occur in connection with chronic diarrhœa. Distension of the abdomen was occasionally observed; it was always tympanic, and appeared sometimes due to the use of unfermented bread developing a prodigious quantity of gas during digestion. Tympanites, however, he remarks, sometimes occurred unconnected with any apparent intestinal or gastric disorder, or even the least alteration of the general health. Under such circumstances no treatment of it was efficacious.

The most usual systemic complications of diarrhœa were malarial cachexia and scurvy. The first gave to the patient a peculiar sallow or muddy paleness, and seemed to be a common cause of the gastric dyspepsia which so frequently rendered all treatment unavailing, especially in effecting a permanent cure. Whatever periodical phenomena arose were readily subdued by the preparations of cinchona; but these had no influence over the fundamental cachexia. Nor did iron always exert the specific influence which it usually displays in pure anæmia.

"I am inclined to believe," Dr. S. remarks, "that the return of warm weather, and regular and active exercise in the open air will be found the only permanent remedies for this state of impaired health. This is the more likely to be true of those cases, and they are the majority, in which malarial anæmia is maintained by chronic disorder of the bowels. The milder ones, occurring in young men of a robust constitution and previously good health, sometimes recover under the influence of iron and a milk diet; but many more are rebellious to every form of medical treatment."

Dr. S. notices cases in which, along with diarrhœa or even without it as a constant symptom, there is also a scorbutic taint, shown in several instances by œdema of the lower extremities, and ecchymoses of these and other parts; but, as far as was observed by him, without any affection of the teeth and gums. In one case the exacerbations of swelling and discoloration of the legs coincided with an increase of diarrhœa and intense fœtor of the breath. Œdema of the ankles without ecchymotic discoloration was frequent Dr. S. thinks it probable that a scorbutic taint was often present without the characteristic symptoms appearing, and when it was not evidenced by the results of treatment. In the greater number of cases it seemed impossible to carry the improvement beyond a certain point much below the average of good health. But very few of such cases can be expected to recover in the wards of a hospital; they stand pre-eminently in need of fresh air, sunshine, and exercise combined.

"I have believed and urged," remarks Dr. S., "that not a few soldiers who are now permanently invalided, would have been saved to their country's service had appropriate provision been made for their systematic exercise in the open air. The advantages of a rural site for a hospital, which in reality are immense, are thrown away if patients of the classes referred to are not required as well as invited to pass a portion of every day in the fields or the woods, in summer, and during the cold season, in sheds with a southern exposure, where they can be exercised in the drill, or in gymnastic and athletic sports."

Muscular rheumatism is a common complaint of the soldier. The direct causes of the disease surround him at every step of an active campaign. Of the scores of cases seen by Dr. S. there was no one in which the attack began as an acute inflammation. All of them were cases of simple muscular rheumatism, or of subacute or primarily chronic rheumatism of the external ligaments of the joints, and often resulted in muscular atrophy or false anchylosis of the affected limb. In some cases the stiffness of the joints yielded to a diligent and persevering use of active and passive motion. In cases characterized by fugitive pains in different parts of the body Dr. S. believes that cod-liver oil will prove to be the most effectual remedy.

An affection liable to be confounded with muscular rheumatism is intercostal neuralgia. It was noticed in robust soldiers as often as in the infirm. It was characterized by tenderness under pressure of the cutaneous branches of the intercostal nerves on either side of the spinal column, or along the lateral regions of the chest, with aching, burning, or boring sensations in these regions, and sharp lancinating pains running to the front of the chest. This affection was uniformly referred by the patients to the action of the knapsack, either by its contusive blows upon the back in marching, or to the free perspiration it causes in the part, and the subsequent chilling which occurs upon its removal when there is a breeze, or else by getting the back wet with rain or in fording streams. The disease was generally cured by the application of stimulating and narcotic liniments or by superficial vesication.

Palpitation of the heart Dr. S. found to be a common disease among the soldiers, in a form very rarely met with in civil practice. It occurred perhaps in every case of intercostal neuralgia. It often, also, originated apparently from a state of extreme exhaustion, especially when occurring after violent and prolonged muscular efforts.

"Its ordinary association with a frequent pulse, or one rendered so by the erect posture, seems to prove it to be an effect of muscular debility of the heart alone, or of that organ along with the rest of the muscular system. It was not attended with any irregularity of the pulse, nor, ordinarily, with any distinct murmur in the heart—not even with a soft blowing murmur—nor was any such observed in the arteries as an ordinary symptom."

Out of some twenty or thirty cases there was but one in which distinct evidence of organic disease of the heart was discovered, and that consisted of hypertrophy alone.

In this form of palpitation, though it was seldom entirely removed, the improvement generally coincided with the patient's improved nutrition and muscular strength.

"Quite different in its nature from anæmic palpitation, which shows its true character by pallor of the tissues, translucency of the superficial veins, and a rapid improvement under the administration of iron, in this, on the contrary, the complexion and nutrition of the patient were ordinarily good, his appetite normal, his defecation regular, and iron proved to be less useful as a remedy than valerian and digitalis; but all these medicines were less serviceable than rest and time."

The numerous cases of hæmoptysis observed among the soldiers, quite independently of any signs of pulmonary tubercles, appeared to have resulted mainly from direct violence, such as a fall upon the chest, a blow from some missile, as a spent ball, the fragment of a shell, etc., or from compression between two heavy bodies.

"It was surprising," says Dr. S., "that in several cases the hæmoptysis continued long after the general health appeared to have become very good. I should have suspected malingering, had not the physical signs of a former pleuritic adhesion and a complaint of local pain sometimes given colour to the history as originally related. The occurrence of hæmoptysis independently of these cases has been very rare. In the only case of phthisis distinctly made out and terminating fatally, there was no discharge of pure blood from the lungs. Several other cases, it may be mentioned in passing, in which a tuberculous complication of chronic bronchitis was suspected, proved, by their perfect restoration to health, that the suspicion was not well founded." D. F. C.

ART. XXI.—*Clinical Lectures on Diseases of Women.* By J. Y. SIMPSON, M. D., F. R. S. E., Professor of Midwifery in the University of Edinburgh, etc. etc. Illustrated with one hundred and two engravings on wood. 8vo. pp. 510. Philadelphia: 1863. Blanchard & Lea.

THESE lectures were delivered by Professor Simpson in his course of clinical instruction at the Royal Infirmary of Edinburgh, and appeared originally in the *London Medical Times* during the years 1859 to 1861, both inclusive. They are now presented by the American publishers in a form more compact and easy of reference than that under which they appeared in England, one through which they will the more readily find their way, as an acceptable addition, into the library of every medical practitioner.

The lectures of Professor Simpson claim our attention, as well from the high professional standing of the lecturer, and the zeal with which he has devoted himself to the especial maladies, surgical and medical, to which the sexual organs of the female are liable, as from the deep interest with which the causation, pathology, and treatment of those diseases are invested. The best instructed and most experienced physician may consult these lectures with profit, while they are adapted to yield a rich harvest of instruction to the younger and comparatively inexperienced members of the profession.

The first two lectures are devoted to the consideration of vesico-vaginal fistula, confessedly one of the most afflicting accidents to which the parturient female is liable, rendering her, too often, loathsome to herself and an object of disgust to all around her, her entire existence being one of complete misery.

Formerly, in consequence of the almost invariable failure of every means that had been devised to afford relief, the accident was looked upon as incurable, and the unfortunate patient was abandoned by her physician as beyond all relief and all hope. Happily, the resources of modern surgery, in their application to the management of the infirmity in question, have been successful in affording very decided relief under even the most discouraging circumstances, and a perfect cure in the great majority of cases.

As the most frequent cause of vesico-vaginal fistula, Professor Simpson classes difficult and prolonged labour, during which inflammation followed by sloughing takes place in the soft parts which have undergone prolonged pressure between the head of the child and bones of the pelvis. He admits that the accident may result, occasionally, from direct injury inflicted by the unskilful use of the forceps. It has been known to result also from long retention of a pessary in the vagina, and to succeed the operation for the removal of a urinary calculus by an incision through the vesico-vaginal septum. Prof. Simpson states that he had under his charge in the Infirmary, some years ago, a very rare case, in which a vesico-uterine fistula ensued from an abscess, which had formed between the uterus and bladder, opening into the cavity of both organs. After some weeks, as the inflammatory deposit was absorbed, the fistulous opening gradually contracted in size, and finally was entirely obliterated.

It is unnecessary to follow the author in his description of the usual situation, extent, and shape of these fistulæ; nor need we stop to notice his remarks in regard to their diagnosis. The presence of the abnormal opening between the bladder and vagina is revealed by symptoms of too striking a character to permit of its being overlooked or confounded with any other diseased condition of those parts. When very minute, its exact location may not at first be very evident in all cases; by the use, however, of a proper speculum the skilful practitioner cannot fail to make it out.

The prognosis in cases of vesico-vaginal fistulæ was, but a few years ago, almost invariably unfavourable; a few cases are reported as having been cured by surgical means, but in the great majority of instances every procedure resorted to for the relief of the patient was alike unavailing.

From a very early period, the obliteration of the abnormal communication between the bladder and vagina was attempted by paring off the edges of the

opening, and then bringing and retaining them in contact by means of silken sutures. This simple operation underwent, in time, a great variety of modifications, which it is unnecessary to notice, as they in no degree prevented its almost invariable failure to effect any decided good, much less a complete and permanent cure. Of late years, however, the operation has been rendered a successful one in nearly every instance by the simple expedient of substituting, for the silk and hemp formerly employed as sutures, silver, iron, lead, or other metallic wire.

Our countryman, Dr. Marion Simms, to whom the credit is, in great measure, if not entirely, due of effecting this important modification in the management of vesico-vaginal fistula, tells us that he operated successively twenty-nine times on one patient, using for sutures threads of hemp or silk, and always without success. In the thirtieth repetition of the operation he made use of metallic sutures, and a cure was promptly effected.

The reason why wire formed of those metals which are the least readily oxidized do not, like thread composed of organic substances, give rise to suppuration and ulceration along their track and in its neighbourhood, Prof. Simpson explains by the fact that the metallic wire in contact with the living tissues remains unchanged, and without exerting upon them any irritating impression.

"If we introduce a metallic wire into a part," remarks Prof. S., "it has no power of absorbing the fluids there, and lies in apposition to the tissues without irritating them. A thread of silk absorbs the fluids thrown out—lymph, or pus, or whatever it might be—and these dead fluids remaining in the thread, and becoming decomposed, render it a small track or nidus of putrefaction and infection."

The material which Prof. S. invariably employs for sutures, and which he believes to be the one best adapted for the purpose, while, at the same time, it is the cheapest, is the ordinary annealed iron wire of the shops, of the size known as No. 32.

For a minute description of the mode of operating, step by step, in cases of vesico-vaginal fistula, we refer our readers to the second of Prof. S.'s lectures in the volume before us.

The succeeding three lectures are devoted to the consideration of one of the most distressing and unmanageable of the diseases incident to the female sex—cancer of the uterus—accordingly as it is seated in the cervix, the body, or the fundus of the organ.

The teachings of the lecturer in respect to the pathology and semeiology of the disease; its anatomical seat and course; its pathological forms; the period of life during which it is most prevalent; its symptoms and diagnosis are sufficiently full, clear, and accurate, while his account of its treatment, as well palliative as surgical or radical, presents in a concise form a very excellent résumé of the views and experience of the most esteemed authorities of Great Britain and Continental Europe.

The existence of cancer in the cervix uteri, which is by far the most frequent seat of the disease, can very generally be made out without much difficulty, by physical diagnosis. When, however, the body or fundus of the uterus becomes the seat of cancer, it is not always readily recognized, and should the cervix be at the same time healthy, which may occur, the true character of the disease may be readily overlooked.

The principal forms under which carcinoma presents itself when its seat is in the body or fundus of the uterus, so far as the observation of the lecturer extends, are the following: 1st. A cancerous deposition in the outer layer of the middle coat of the organ, or in its sub-peritoneal, or peritoneal coat; or, 2d. The cancer may implicate the whole thickness of the uterine walls, without the occurrence of any protrusion or prominence externally or internally; or, 3d. Which is most commonly the case, the cancer may occur in the mucous or submucous coat of the body or fundus, producing cancerous ulceration of the whole interior of the uterus, ending in fatal rupture of the fundus; or, as the lecturer has more frequently seen, assuming the character of an irregular sessile excrescence or fungous mass, projecting into and distending the uterine cavity, or even dilating and passing partially through the healthy though distended os uteri.

Cancer in the uterus, as in every other location, is unfortunately but little under the control of medicine, and only to a very limited extent can it be eradicated by the knife of the surgeon. In the great majority of cases it pursues with certainty its fatal course, with more or less rapidity; death ensuing within a few months, or, at furthest, within two or three years subsequent to the detection of the presence of the disease. In aged persons, it is true, cancer of the uterus will run sometimes a very protracted course, assuming the same slow and sluggish movement which characterizes, in advanced life, all the vital functions and processes.

After passing in review the several means that have been resorted to for the purpose of palliating the more prominent and distressing of the local symptoms of cancer-uteri, Prof. S. discusses the question as to the value of the two surgical operations recommended for the radical cure of the disease—the extirpation of the whole organ, and the removal, simply, of the diseased cervix.

The first of these operations the lecturer considers to be of so hazardous a character as to render it unjustifiable in all cases and under all circumstances. His remarks in respect to the second of the operations referred to are replete with caution and highly judicious. The excision of the cancerous os uteri is attended with much less danger than the removal of the entire organ, and has been occasionally performed with the most decidedly beneficial results. It is applicable, however, to only a very limited number of cases—those in which the cancer is seated in the lips of the cervix, and is strictly limited to the vaginal portion.

After describing the mode of operation when amputation of the cancerous cervix is decided upon, the lecturer points out very clearly the dangers attendant upon the operation. These are, 1st, excessive hemorrhage, of far less frequency, however, since the substitution of the *écraseur* for cutting instruments; 2d, fatal collapse of the system.—We do something, in the opinion of Prof. S., towards the prevention of this alarming and dangerous complication by obviating the necessity of forcibly dragging down the uterus from its position in the pelvis; 3d, wounding the peritoneum, an accident which is especially liable to occur when the *écraseur* is used, and cannot always be avoided by even the most skilful management; 4th, surgical fever and inflammation, accidents liable to occur and destroy the patient after every form of operation where a cutting instrument is employed.

The subject of lecture six is the treatment of carcinoma of the mamma, with especial reference to the removal of the diseased tissues by caustics, as well when the disease is seated in the neck of the uterus.

According to Prof. S., the small number of cases in which the permanent removal of cancer when it occurs in either of these locations can be effected by the knife—the proportion of successful cases not being more than from one to four out of one hundred operated on, affords but slight encouragement for a repetition of the operation. Still, it is to be kept in mind that we can never determine beforehand which of the one, three, or four cases of the hundred is that which will prove the successful one. The happy result has, in some instances, been attained where circumstances appeared to be the most unfavourable—the cancerous tumour having been ascertained by microscopic examination to be of a most decidedly malignant character.

But the operation has been objected to upon other grounds than that of its general failure; thus, it has been asserted upon good authority that unless it be very early performed, before the morbid mass has attained any great degree of development, the operation acts injuriously by weakening the patient and by exciting renewed action at the seat of the cancer, hastening, thus, the progress of the disease, and shortening the life of the patient. The operation, besides, is not without its direct danger. Itself, or its immediate consequences, have, in fact, been the cause, it is stated, of death in one-fifth of the cases in which it was resorted to.

Prof. S. believes that the chance of a favourable result in the treatment of cancer by caustics is much greater than when the knife is employed. Over the latter it has, also, other advantages. Thus, patients who have an almost unconquerable dread of the knife will sometimes be found ready to submit to

the action of caustics. The employment of these has a further advantage over that of the knife, it does not require confinement to bed, nor the same loss of time, and as it requires neither ligatures to arrest bleeding from divided arteries, nor sutures to effect and preserve coaptation of the edges of the wound, consequently all the principal dangers attendant upon the use of the knife are obviated, or, at least, their liability to occur is lessened.

The use of caustic in preference to the knife is further urged from the fact that, while by its action as much of the diseased structure may be removed as by the knife, there is, in addition, the probability that a part of the caustic will be absorbed and infiltrated into the surrounding tissues, so as to destroy or modify the character of any cells which may remain capable of taking on a cancerous type of development.

Formerly caustics were considered applicable only to cancers with open surfaces, and in such where the remedy is permitted to remove the diseased mass layer by layer. But latterly, various methods have been devised—admitting of still further improvement—by which the caustic can be so applied as to destroy the tumour from its centre or base.

After a brief notice of the different caustic substances that have been employed for the destruction of cancerous structures and the manner of their application, Prof. S. expresses his preference for the sulphate of zinc, dried and powdered.

The application of caustics to the cervix uteri is believed by the lecturer to be attended with more danger than to the mamma as the near vicinity of the peritoneum renders it liable to be readily reached and fatally injured. The most manageable of all the strong caustics in reference to the cervix uteri, he considers to be the dried and powdered sulphate of zinc. It may be applied to the seat of the disease, through the speculum, in the dry form, or without a speculum in the form of medicated pessaries, made with as much of the sulphate of zinc as the ointment can be made to take up. The medicated ointment is to be passed, by means of the finger, into the cavity of the existing ulcer, which is to be carefully filled up with two or more pessaries. It may be well, likewise, to introduce into the vagina below, two or three pessaries made with carbonate of soda, to neutralize the zinc should it happen to run down.

Dysmenorrhœa is the subject of the seventh and eighth lectures. This extremely frequent and often intensely painful affection, Prof. S. treats of under the heads, ovarian and uterine dysmenorrhœa, according as the pain has its seat in one or other of these organs. Ovarian dysmenorrhœa is, in the majority of cases, the result of a mere exaggeration of the normally increased hyperæmia and excitability of the ovaries preceding and accompanying the menstrual function. Uterine dysmenorrhœa, the lecturer refers to various morbid conditions of the womb. 1st. The *neuralgic form*. 2d. The *congestive*, dependent upon an exaggeration of the ordinary phenomena of menstruation. 3d. The *inflammatory*, dependent upon inflammation of the cervix uteri. 4th. The *gouty* or *rheumatic*, occurring in patients subject to gout or rheumatism. 5th. Complicated with organic disease or displacement of the uterus. 6th. *Membranous dysmenorrhœa*. 7th. *Obstructive dysmenorrhœa*.

It is somewhat doubtful whether the diagnosis of these several forms of uterine dysmenorrhœa can always be very clearly made out, or that occasionally more than one of the causes to which they are severally referred, may not present themselves in the same case.

Let this be as it may, the account given of the disease by the lecturer, taken entire, is particularly clear and instructive.

The membranous form of dysmenorrhœa, was formerly supposed to be an inflammatory affection giving rise to a fibrinous or plastic effusion upon the interior surface of the uterus, which, at the period of menstruation is thrown off and discharged in the form of a membrane, having the shape and size of the uterine cavity. It is now, however, almost universally conceded that the membrane and shreds of membrane, discharged in certain cases of dysmenorrhœa, are nothing more or less than exfoliations, to a greater or less extent, of the uterine mucous membrane in a hypertrophied condition, such as takes place in the earlier stages of pregnancy. This is proved by examining the membrane

under the microscope, when it will be found to present the complex structure of the mucous tissue, containing crypts or follicles with nucleated cells, and vessels intervening. Virchow tells us that in the examination of the bodies of women who have died whilst suffering from dysmenorrhœa, he has found the mucous membrane of the uterus in a state of partial separation; supplying, thus, a distinct anatomical proof of the doctrine referred to.

In the next three lectures various affections of the vagina, vulva, and labia pudenda are treated—many, it is true, of no very serious import, and yet all of sufficiently frequent occurrence and attended with an amount of distress and annoyance to demand upon the part of every practitioner a perfect familiarity with them—their causes and symptoms—their true character, diagnosis and treatment. Upon each of these points the lectures before us will be found to supply the needed information—clearly expressed, and based upon an amount of personal experience on the part of the lecturer, adapted to give to that information a high degree of reliability.

Among the diseases treated of in these three lectures is the purulent vulvitis of infants and children: An affection which claims the serious attention of the medical practitioner, less, however, on account of its really serious character than because of its importance in a medico-legal point of view. Very often, especially when it occurs in the children of the lower and ignorant classes of society, the disease is imputed by the relatives and friends to a venereal infection. An ignorant and excitable mother will, by threats and by suggestive and leading questions, cause the affrighted child to own to some absurd and groundless tale, in confirmation of her theory of the origin of the malady; in consequence, men have been accused, tried, and even convicted of infecting young children by forcible sexual intercourse, when they were entirely innocent of the crime, and when the disease of the child had a totally different origin.

Like many other local inflammations the predisposition to purulent vulvitis in childhood is very often to be ascribed to some degree of impairment of the general health of the patient from habitual exposure to a damp and impure atmosphere, with bad diet, etc., while its immediate or exciting cause is usually exposure to cold and wet, want of personal cleanliness, the irritation of acrid urine, etc. The disease has been known to attack more than one child in the same family, and to prevail as an endemic, or very circumscribed epidemic, in certain damp, crowded, ill-ventilated and otherwise unhealthy localities.

Purulent vulvitis in young children usually begins with local heat and itching, some degree of redness and swelling, pain and scalding in making water, and sometimes uneasiness in walking. It is not, usually, until the end of the first twelve or twenty-four hours that any discharge takes place from the inflamed surface. The discharge is at first thin and of a mucous character, but soon becomes yellow, or of a yellowish green tint, and purulent. Occasionally it is profuse. Along the outer edges of the external labiæ it is apt to become thick and hardened, gluing the opposed edges slightly together. The disease rarely extends upwards into the vagina or urethra. Occasionally there is, at spots, an appearance of vesicular or pustular eruption; indeed, some type of mucous eruption would probably be found to be a common, if not constant, phenomenon of the disease had we an opportunity of searching for it at an early period of its course. Sometimes, but rarely, there supervene one or two spots of ulceration, especially towards the orifice of the vagina.

Acute infantile vaginitis shows, like other analogous affections, a natural disposition to run through a definite and often short course, with a tendency to cease spontaneously. If not arrested, it sometimes assumes, however, a chronic, protracted form, giving great annoyance and distress to the patient. In its early stage, a dose, or perhaps two, of calomel or gray powder, with a few grains of magnesia, due attention being paid to cleanliness, diet, air and exercise, is sometimes all that is necessary to effect a cure. If the discharge becomes protracted, a course of chalybeates and tonics will become necessary, to bring the constitution and its principal functions as near as possible to the normal standard of health.

In the early or more inflammatory periods of the disease, frequent local ablution with warm water or warm milk and water will be found among the best and

most soothing applications; while sitting in a warm hip-bath during micturition is one of the surest means for relieving the pain and scalding attendant on the passage of the urine; at a later period, when there is much local smarting and pain, a solution of acetate of lead, with acetate of morphia—2 grains of the first and one of the latter to the ounce of water—forms an excellent sedative lotion, or we may use a weak solution of borax or of nitrate of silver. It is a good plan to leave between the labia a slip of lint wet with the sedative lotion. In general, however, better effects will be derived from sedative liniments applied several times a day by means of a brush or feather. In this way we may use cold cream or equal parts of olive oil and lime water. As local applications, liniments are more lasting in their action than lotions, and not so apt to fret or irritate as ointments. Subsequently it will be necessary to resort to local astringents, in connection with or as a substitute for those of a merely sedative character. Tannin, sulphate of zinc, aluminated iron, or any analogous astringent, may be employed in the form of lotion or liniment; care being taken to use them of such strength as to prevent them from exciting such an irritation as to oblige us to again return to the sedative treatment.

An affection is described by Prof. S., of some importance as well from the suffering by which it is generally attended, as from the fact that it is liable to be misunderstood by the young practitioner, and the only means adapted for its cure, in consequence, overlooked. We allude to fissure of the orifice of the vagina, in the form of a linear, irritable ulcer or cleft in the mucous membrane of the os vaginæ, seated almost invariably at its posterior commissure. The fissure of the vaginal orifice is a source of pain when any exercise is taken which causes motion of the part; pain is, in some cases, only felt during defecation or micturition, or when the urine gets into the fissure. Marital intercourse sometimes becomes intensely painful. By the finger there will be detected the existence of a painful point behind and on the posterior aspect of the vaginal orifice; on inspection, the eye discovers in the posterior angle a small red linear ulcer, and, especially when chronic, having rough, slightly elevated, and everted edges.

The most common cause of the disease is the tearing of the perineum which occurs so frequently, to a greater or less extent, in first labors. If this tear heals slowly and imperfectly, the linear form of irritable ulcer which constitutes vaginal fissure is liable to result.

The treatment is very simple and effective: the introduction of two or three fingers to dilate the vaginal orifice and thus tear open the edges of the fissure, so as to convert it into a larger ulcer, which may be healed by the use of cold water or simple lotion. This plan Prof. S. considers preferable to the division of the fissure by the knife.

Lectures 12, 13 and 14 treat of the nature, the etiology and the semeiology of surgical fever—the character of the secondary lesions which result from the disease, with its prophylaxis and curative treatment. These lectures are among the most interesting of the present series. Not only do the author's views of the pathology of the particular form of fever which is liable to occur after surgical operations, and to which is mainly to be attributed the unfavourable results of such operations—especially at certain seasons, and in the crowded, illy ventilated, and badly policed wards of certain hospitals, press themselves with great force upon our attention. They furnish a consistent explanation of all the facts connected with the development of the fever in question, and of the true character of the pathological lesions detected in the course of its careful clinical study, while the very interesting parallelism which Prof. S. has drawn between surgical fever and the more malignant form of the so-called puerperal fever calls for the serious consideration of every practitioner of obstetrics, as well as of physicians generally.

Extensive comparative tables are presented of the lesions most frequently met with in the fever consequent upon various surgical operations, and in puerperal fever, which, so far as the exhibition of facts embraced by them goes, confirm the views of those who, with the lecturer, consider the two diseases as analogous if not identical in their nature and cause. The difference in the frequency with which different internal organs are liable to become the seat of acute inflammatory effusions and changes in the two diseases, respectively, Prof. S.

believes to be mainly, if not entirely owing to the difference in the seat of the primary lesion. But little difference in this respect was found to exist when the more prominent lesions of puerperal fever were compared with those detected in cases of surgical fever following operations or injuries implicating the pelvic organs.

While we very freely admit that the views in respect to the pathology of puerperal fever, so ably set forth by Prof. S., afford a very plausible, perhaps an entirely correct explanation of the nature and mode of production of one and probably a very frequent form of the disease, we still cannot admit that they furnish the key to the etiology of puerperal fever whenever and under all the circumstances it prevails. There is on record a vast accumulation of facts derived from many independent sources which force upon us the conviction that the so-styled puerperal fever, especially when it occurs as an epidemic, is capable of being produced by some unknown atmospheric poison. The influence of which poison is not confined exclusively to puerperal women—notwithstanding we may admit their greater predisposition—but is experienced, to a greater or less extent, by nearly all who come within the sphere of its action, whether male or female.

The suggestions contained in the following extract from lecture 14 is deserving of serious consideration on the part of both surgeon and accoucheur.

"Surgeons have hitherto scarcely, or indeed not at all, attended to a kind of prophylactic which ought to be to them of great importance, provided surgical fever is so analogous as I believe it to be to puerperal fever, as to be capable of being propagated by similar means. Almost all English accoucheurs believe that occasionally puerperal fever is liable to be communicated by the medium of the medical practitioner from a patient already attacked to a person in labour, it being spread from the diseased to the healthy by the accidental inoculation into the latter of morbid inflammatory secretions thrown out in the course of the disease in the body of the former. The evidence of the truth of this fact, as far as regards the communicability of puerperal fever, is, I think, quite overwhelming to any unprejudiced mind, and the neglect and defiance of it are constantly leading to unnecessary because avoidable mortality, particularly in the practice of continental obstetric hospitals. Do the surgeon or his attendants after handling the wounds of patients labouring under surgical fever, or coming in contact with their discharges, and any zymotic poison or poisons contained in them, and immediately afterwards touching recent surgical wounds in new patients, ever inoculate into these wounds a zymotic poison capable of stirring up surgical fever in the new surgical patient, supposing he is otherwise predisposed to an attack of the disease? I believe that surgical fever is often enough propagated in this way, just as puerperal fever is. Surgeons will tell you that they have occasional runs of bad luck among those upon whom they operate. In other words, they have surgical fever occasionally in their practice, and are spreading it from patient to patient; and ought, under these circumstances, to do what I once heard of a distinguished English surgeon doing, viz., locking up his knives for some weeks. They should, like the accoucheur, under similar circumstances, suspend their practice for a time. Perhaps surgical fever is spread in this way in hospitals by surgeons themselves, by dressers and nurses, to a degree that at present is not yet dreamed of."

In Lectures 15 and 16, Prof. S. discusses the pathology and treatment of Phlegmasia Dolens. He objects to the doctrine advanced by Dr. Davis, and adopted by nearly all subsequent writers, which attributes the production of phlegmasia dolens to an obstruction to the passage of the blood through the principal vein of the affected limb, from an obliteration of its canal caused by an attack of phlebitis. He adduces a series of observations which go to prove that obstruction of the femoral vein is insufficient of itself to give rise to the characteristic phenomena of phlegmasia dolens; and that the latter may even occur while that vein remains entirely pervious. Prof. S. believes with several recent observers, that in order to give rise, not simply to the œdema, but also to the heat, swelling, tension and paralysis characteristic of the disease in question, there must take place a consolidation of blood in the entire ramification of vessels which coalesce to form the tributaries of the femoral vein: the resulting

disease being in proportion to the number of the vessels in which this consolidation occurs.

From the experiments and observations of Dr. Mackenzie, it seems probable that the coagulation of the blood in the branches and ramifications of the crural vein is due to the presence in the blood of a morbid matter through which such an influence is exerted on the internal surface of the veins as to lead to a consolidation of the blood they contain; the blood of the puerperal female, it may be remarked, being, from various causes, always so altered as to render it peculiarly liable to spontaneous coagulation within the vessels, assuming a state of thrombosis, as it has been termed, with all its consequences.

"Modern pathology," remarks the lecturer, "teaches us that, in the first instance at least, this venous coagulation, consolidation, or thrombosis, may arise without any previous inflammation of the veins, which at first are simply obstructed and occluded by the plug of consolidated blood. If the internal coats of the veins are found with evidences of inflammatory changes after death, these changes may in general be correctly regarded as secondary phenomena, and the inflammation of the venous walls which led to them as a secondary result, produced by the irritation and pressure of the contained thrombosis, and by the changes which take place in the obstructing mass. So that, if this doctrine be true, phlegmasia dolens does not arise from phlebitis properly so-called, but is immediately due to obstruction of the veins by coagulated blood, and any resulting phlebitis is a secondary consequence only. This coagulation of the blood and obstruction of the veins may, in their turn, depend on one or other of two causes, viz: either, first, on some morbid alteration in the blood itself, tending to its consolidation or coagulation, or, second, on some morbid condition in the lining membrane of the veins, in virtue of which the relation between the bloodvessels and the blood becomes disturbed, and coagulation of the latter is induced. I believe that in some cases of phlegmasia dolens this required morbid condition in the lining membrane of the veins may be primarily due to phlebitis, as where the veins of the uterus have been inflamed, and the inflammation having extended, by continuity, to the iliac vessels has led to coagulation of blood in the veins below. But in the great majority of cases it seems to me that we must look for the primary cause of the disease in some morbid condition of the circulating fluid, leading first of all, perhaps, to some peculiar change in the lining membrane of the veins, and through this, secondarily, to coagulation of the blood, occlusion of the vessels, and obstruction to the circulation in the limb."

The general indications of cure as laid down by the lecturer are: 1st, depuration of the blood by the use of emetics, when not contraindicated by the condition of the patient, diaphoretics, and purgatives in the early stage of the disease, and not pushed so far as to produce any very debilitating effects. 2d. In the commencement of some few cases when the pulse is high and strong, and general symptoms of fever prevail, the use of antiphlogistics and febrifuges may be indicated. They must always be used with great caution and never to any heroic degree. 3d. From an early period of the disease, in some asthenic cases from its very onset, indeed, tonics and stimulants will be demanded. Wine and the preparations of iron and quinine are among the best, especially in the second stage of the disease. The local indications are: 1st, the use of local antiphlogistics. These should, perhaps, be reserved for cases in which secondary phlebitis ensues. To relieve pain, opiates should be freely given internally, and the affected limb enveloped in a wet towel or a sheet of dry cotton wadding, carefully and completely covered with oil cloth, to prevent the escape of the insensible perspiration. Sedative liniments sometimes afford great relief—such as olive oil and laudanum in equal parts, or two parts of oil and one of chloroform, or the officinal opiate liniment. Rest and elevation of the limb are to be enjoined. The best and most steady position of the limb is obtained by placing it on an inclined plane formed by raising the lower half of the mattress by inserting some convenient body beneath it. 2d. Absorption is to be promoted by a flannel bandage applied pretty tightly to the limb from the toes upwards, frequent frictions, the use of stimulating liniments, and the occasional application of a small fly blister to the groin. 3d. When the swelling has been

reduced, an effort is to be made to restore power to the limb. This is to be done by perseverance in the use of frictions, bandages, and warm douches. Sea bathing will often do good—local stimulants, such as galvanism, may be tried—and the natural use of the limb in the exercise of walking commenced as early as it can be done with safety.

In the seventeenth lecture Prof. S. treats of a very annoying disease, and which is not unfrequently attended with intense suffering, the true nature of which has only very recently been satisfactorily made out. To indicate its seat and most prominent symptom, the lecturer proposes to name it *coccyodynia*.

The leading symptom of the disease is pain in the region of the coccyx, experienced by the patient whenever she sits down or rises up, and sometimes while she continues seated. Occasionally, the pain is felt in walking, and during defecation. It differs in intensity in different cases and at different periods. The distinguishing feature of the disease in every case is pain at the lowest point of the spine, or rather in the site of the coccyx where, when pressure is applied, the pain is always aggravated.

The disease is evidently caused by the action of the muscles inserted in a coccyx the articulations of which have been rendered morbidly sensitive from some injury they have received or by inflammation or other diseased condition of them or of the surrounding fibrous tissues.

Constitutional remedies are of little avail in the treatment of this affection. Occasionally relief is obtained from leeches applied over the seat of the disease, and followed by counter irritation, while the patient is kept at rest, and placed, at the same time, under a general antiphlogistic treatment. The only certain means of securing entire and permanent relief to the patient is the complete separation, by the knife, from the coccyx of all the muscular and tendinous fibres in connection with it. For the manner of performing the operation we refer to the lecture before us.

The next subject treated of (Lectures 18, 19) is pelvic cellulitis; a disease of great importance, from the frequency with which it is met with in practice, and the mischief to which it may give rise if overlooked or mismanaged in its earlier stages. For our knowledge of its true pathology we are almost exclusively indebted to very recent investigators. It is, strictly speaking, an inflammation of some portion or all of the cellular tissue of the pelvic cavity, and which may give rise to an effusion of serum, pus, or coagulable lymph, or to a sloughing of the inflamed tissue.

Though often a tedious and troublesome disease, it is seldom a very fatal one. When, however, it has terminated in suppuration and an abscess forms, a fatal result may ensue by the bursting of the abscess into the cavity of the peritoneum exciting peritonitis; or the cavity of the abscess, after it has burst and the pus has found its way externally, may not close up, but continue to discharge a purulent matter, and if the sinuses formed are of considerable extent and the discharge copious, the patient may sink finally under the long-continued drain; and, finally, in a few cases, after subsiding for a time, the disease has been found to return again, and become gradually established in a chronic form; the patient dying finally of tubercular peritonitis. In such cases the patients, no doubt, were of a tuberculous diathesis—the cause, however, of the development of tubercular disease in the peritoneum was, there can be but little doubt, the irritation so long kept up in the pelvic cavity by the subacute cellulitis.

For a very full and able account of the pathological anatomy, symptoms and diagnosis of pelvic cellulitis, and its proper management before and after suppuration has been established, we refer to the lectures of Prof. S. Their attentive study will afford ample compensation for the time devoted to the task.

In the 20th lecture, Prof. S. gives a very full, clear, and able account of peri-uterine or pelvic hæmatoma, or the effusion of blood which occasionally takes place into the tissue filling up the angles and spaces between the layers of the pelvic fascia. It is of less frequent occurrence than the affection last described, and less understood, while it is more fatal. It is only lately that the attention of pathologists have been directed to the investigation of its true character and causes. In relation to the latter of these questions there still exists much difference of opinion. Prof. S. believes that it is produced by a rupture of one of

the veins or arteries—sometimes in a varicose state—that supply the ovary and pass to it between the layers of the broad ligament. Occasionally, however, he admits that the pelvic hæmatoma has a different source and site. The tumour produced by the infiltration and accumulation of blood in pelvic cellular tissue, differs in size and shape according to the amount of blood poured out and the part into which it escapes.

For the symptoms attendant upon the disease, its usual course, the indications for its treatment, and the means by which those indications are to be carried out, the reader is referred to the lecture before us.

Spurious pregnancy is the subject of the next two lectures. The curious condition of things which has often led to the belief on the part of the patient and her friends that pregnancy exists, when there is no fœtus present in the uterus, may result from either local or constitutional causes. This, in certain cases of dysmenorrhœa, where the patient has occasionally, or perhaps at each menstrual period, an excessive development of the uterine mucous membrane, which is in part cast off in the form of a distinct production, resembling in all respects the decidual membrane of pregnancy, besides the expulsive pains which attend the discharge from the womb of these uterine casts, the patients may be affected, also, with some of the ordinary and constitutional and sympathetic phenomena of pregnancy. Such as sickness and vomiting, enlargement of the mammæ and darkening of the areolæ, observed some one or two weeks before and after the expulsion of the uterine cast referred to. The more frequent form of spurious pregnancy, however, is that in which all the more striking phenomena are of constitutional origin without any appreciable local change. There are nausea and vomiting, enlargement of the mammæ, darkened areolæ, and a milk-like secretion. The abdomen enlarges gradually until, occasionally, it assumes a form and size as though it were occupied by a gravid uterus, and movements are felt by the patient simulating those of a living fœtus. The menses are occasionally suspended or irregular and scanty. These phenomena may go on progressively for a period of nine months or until symptoms, as may happen, resembling those of labour set in; and it may be the case that it is not until the accoucheur is sent for that the patient discovers that she has never been pregnant.

This constitutional form of spurious pregnancy the lecturer believes may depend in some way upon the changes which occur in the ovaries and the uterus at the period of menstruation.

"When the irritation associated with the normal or physiological changes in these organs is somewhat excessive either in degree or duration, and is repeated from month to month, the sympathetic phenomena excited at one period have not, in some instances, had time to subside before a new stimulus is supplied for their continuance by the recurrence of the menstrual molimen. True pregnancy occurs when the ovulum which escapes from the Graafian vesicle duly meets, within the mother's body, with male spermatozoa, and, as a consequence, a long nine months series of local and constitutional phenomena immediately begins to be set up. But the same series of constitutional phenomena, at least, is set up in cases of pseudo-cyesis when an ovulum escapes, or a reproductive nisis occurs, without any male spermatozoa being present; these phenomena occasionally ending, as we have seen, at the usual extreme term of utero-gestation, in a simulated parturition."

False pregnancy may, it is true, be sometimes found associated with, and perhaps its phenomena continued and exaggerated by the most dissimilar forms of uterine or ovarian disease, but no such association necessarily or very frequently exists; so that the disease would seem to be dependent rather upon some disturbance of the ordinary function of the generative organs than to any organic disease of these organs attended and attested by material changes in their intimate anatomical structure.

Lectures 23 to 30 inclusive are devoted to a very full account of the more common forms of ovarian disease, and an examination of the several plans proposed for its cure—the question in respect to the value and propriety of ovariotomy—the cases to which the operation is adapted and the results of its employment. The whole subject is treated by Prof. S. at great length, and with perfect

candor and unquestionable ability. We must pass by these lectures, however, without further notice: not that we would in any degree underrate the importance of the subjects discussed, or the value of the lecturer's observations, whether pathological or practical, in respect to them, but because in another part of the journal our readers will find a more full and complete review of the received views in respect to the pathology of ovarian disease and its treatment than we could hope to furnish, in a commentary upon the lectures of Prof. S., comprised within the narrow limits to which we are necessarily restricted, even were our personal experience in the management of these diseases far greater than it actually is.

We shall be obliged also to pass by without comment the subject of the thirty-first lecture, in which we have a description of cranioclasm; an operation introduced by the lecturer for breaking in pieces the bones of the fœtal head, and in this manner reducing its size and altering its shape so as to permit of its passage through a very contracted pelvis. The operation of cranioclasm, that is to say, of skull crushing, may be substituted, the lecturer believes, with great advantage, for those of crainotomy and cephalotripsy, in those rare cases of parturition in which it is deemed necessary to have recourse to some means of diminishing the bulk of the fœtal head with the view of terminating the labour with safety to the mother, a result which appears to be in any other way impracticable. He is convinced that the new operation will be found to be, at once, safer for the mother and more easy for the practitioner than either of the two dangerous forms of operative procedure it is intended to supersede. It would scarcely be possible by any mere description, unaccompanied by the drawings, by which the lecture on cranioclasm is illustrated, to give an accurate idea of the operation.

An interesting lecture follows on some of the more prominent affections of the Fallopian tubes. The most frequent, perhaps, and certainly the most important of these affections, is dropsy—of which a highly satisfactory account is given by Prof. S. The operation he recommends for the cure of this form of dropsy, after its existence has been very certainly made out, is at once easy, simple, and comparatively safe. It consists in puncturing the cyst in which the fluid is contained with an exploring needle, introduced through the roof of the vagina; the fluid being allowed to escape by draining slowly through the tube of the instrument. By this procedure there is caused either an obliteration of the sac or such a change in its lining membrane as will prevent it thereafter from furnishing the dropsical fluid by which it had been distended.

Lecture thirty-three treats of a disease of which the causes and pathological nature are by no means well understood: we allude to puerperal mania, or that mental disturbance which occasionally occurs during the puerperal state, at some period, usually between delivery and the termination of lactation. It is often found to be associated with a hereditary tendency to insanity. The usually received views in respect to the nature and etiology of the disease will be found to be very fully discussed by the lecturer, while the account given by him of the treatment which experience has shown to be the most successful in restoring the mind to its wonted sanity is full, clear, and satisfactory.

The subjects treated of in the four remaining lectures, are particularly interesting. The young practitioner will find more than one of them but slightly alluded to, if noticed at all, in the received practical treatises on the diseases of women. The affections to which we have reference are sub-involution of the womb after delivery, super-involution of the womb, and amenorrhœa. The latter can, in no case, perhaps, be considered as of itself a disease, being invariably a mere symptom of some passing disturbance of function in the organs to the action of which the menstrual flux is due or to their permanent organic lesion. Following in the steps of previous teachers of the gynæcia, Prof. S. treats of amenorrhœa in reference to its semeiology, and symptomatology, while he describes its treatment, under the heads of symptomatic, constitutional, specific, and local; with a few words in conclusion on amenorrhœa connected with undersized uterus.

If, as we believe, the arrest of the catamenial flow is invariably dependent upon ovarian or other disease, it must be evident that the only rational and successful

means of effecting the re-establishment of the flow is the removal of the disease to which its stoppage is due, and that all remedies used for the specific purpose of bringing on the flow without reference to the condition of the organs concerned must necessarily fail in producing the desired result. We are pleased to find the lecturer expressing his doubt of the action of any drug or combination of drugs as a specific emmenagogue. The good effect of most of the reputed emmenagogues is, no doubt, due to their invigorating influence upon the general system of the patient. Whatever may be, however, their *modus operandi*, some of them have so often proved useful in practice that, as Prof. S. remarks, the physician will feel himself, in nearly every case, bound to make full trial of them before having recourse to any more direct local remedies. Even after it has been found necessary to resort to the latter, he thinks that their use may, with propriety, be still continued.

The lecturer's account of amenorrhœa and the treatment demanded in the several morbid conditions under which it occurs, is well worthy of a careful perusal.

Our desire has been in our notice of this volume, to direct the attention of our readers to the character of its contents, in the hope of attaining for it a place in their respective libraries. We are persuaded that they will find it a ready and faithful guide in facilitating their investigation of the nature of some of the most common and serious of woman's ailments, and an admirable exponent of the most approved views in respect to their therapeutics—compared with and enforced by a comparison with the author's own ample experience as to their most successful management. D. F. C.

ART. XXII.—*Chemistry.* By WILLIAM THOMAS BRANDE, D. C. L., F. R. S. L. & E., and ALFRED SWAYNE TAYLOR, M. D., F. R. S. Philadelphia: Blanchard & Lea, 1863. 8vo. pp. 696.

THE constant advance of chemical science seems to entail upon its teachers the necessity of frequently placing before its students new expositions of the theories and facts as guides to its study. The names connected with the work before us, the former the well known author of the *Manual of Chemistry* which has passed through at least six editions, and the latter the leading medical jurist of England, are sufficient to claim for it immediate recognition and welcome reception. Prepared expressly for medical students and the general reader, the intention has been to provide an introduction to the science of chemistry, which should be adapted to all classes, and comprise a selection of the more important facts and theoretical views of the modern science, expressed in the language most generally adopted in the schools and colleges in which this department of knowledge is taught. It is certainly desirable that chemistry should be considered as one of the fundamental branches in which the physician and pharmaceutist should not only be well instructed in their preliminary studies, but with which they should likewise be induced to keep up, in that limited extent which a correct appreciation of the value of the science to physiology, materia medica and pharmacy, demands. Unfortunately while the lectures on chemistry are, from their experimental character, very attractive and interesting, they do not always invoke a desire to obtain such a clear insight into the subject which can only be obtained by mastering at the commencement those technicalities which are unavoidable in any exact science, but which, when once overcome, not only render the way clear, but assist materially in its comprehension and remembrance. Many of our text-books are of such a character that, although they give a very clear and ample exposition of the science, yet deal so sparely in the useful applications, that the practical mind does not receive an adequate response to its "cui bono" inquiry, nor can they be used as works of reference in those common cases in which physicians and pharmaceutists and the general reader are so frequently desirous of satisfactory information. This end is ade-

quately attained in this work, in some instances by ample detail, in others by incidental mention sufficient for the purpose in view. Thus while the general means by which each particular poison may be distinguished, are fully treated of, in a special instance, one very common and highly injurious, that of arsenic green in wall paper, the most ready mode of detection is so clearly described that but little chemical knowledge is required for its practice.

The work is comprised in four parts. The first treats of matter and its properties, under the general relations of the physical forces, crystallization, affinity —equivalents, nomenclature, and notation. Those departments of physics which are usually found in this portion of the text-books, caloric, &c., are not included as distinct subjects of study, but sufficient for the purposes is introduced incidentally in appropriate places to render the absence of special consideration of no disadvantage. The second part contains the account of the metalliods or non-metallic elements, and here the importance of this division is shown by the more elaborate detail in the explanation of processes, properties, and applications. The aim of the author being "directed to the elucidation of the most important facts and principles, omitting altogether those details which are either of a controversial nature or not yet established on a satisfactory basis." It may here be remarked, that in the first part when speaking of the constitution of salts, the theory which considers them as composed of acids and bases is adopted, and in the American edition, which has received additions from one of the authors, it is advocated to a greater extent than in the original work. It is in this portion that we miss the illustrations, which have of late become so common in the text-books of science. Those which are useful to the beginner, especially if absent from large cities, would take up space which is otherwise better occupied in a work intended either as a text-book in following a course of lectures or for the use of more advanced students, and their want can be readily supplied in the works on practical chemistry which are now attainable. The third part gives a condensed view of the metals and their principal combination, considered in all their ordinary relations so as to be consulted by persons with diverse view, without disappointment.

The last part is devoted to organic chemistry. This department of the science has latterly progressed with such rapid strides that it requires no little amount of moral courage even to undertake the labour of giving a condensed exposition of its present condition, and it is hardly a matter of surprise, therefore, that this part should be less complete and satisfactory than the previous ones. At the same time it must be admitted that the subjects are treated in the same clear and practical manner, and the amount of new information is equal in proportion to that contained in the former portions. We feel confident that this work will recommend itself to all for whom it is intended, not only to study for a time, but to be placed on the shelf as a work of frequent reference.

R. B.

ART. XXIII.—*Researches upon the Anatomy and Physiology of Respiration in the Chelonia.* By S. WEIR MITCHELL, M. D., and GEORGE R. MOREHOUSE, M. D. Washington City: Published by the Smithsonian Institution, April, 1863. 4to. pp. 39. Illustrated with 8 wood-cuts.

IN this admirable monograph we recognize another important step in the onward march of physiological research. A long-accepted error is herein exposed and rectified, and new landmarks of facts, concerning both structure and function, are set up as guides for future investigators. The facts are the more valuable inasmuch as they aid materially in forming in the abstract a true conception of the respiratory function—that mainspring of all the complicated acts which collectively constitute organic life.

The object of this memoir is to show that turtles, unlike the frogs, do not inspire by an act of deglutition, but that their respiration is effected by inspiratory and expiratory muscles situated within the trunk.

The opening pages are devoted to a brief account of the anatomical history of the organs of respiration in Chelonians. The earliest work upon this subject, noticed by our authors, is a "Dissertation on the Respiration of the Tortoise," by Robert Townson, LL. D., written at Göttingen in May, 1795. This is a short but highly interesting tract; and as it contains a brief review of all that was previously known upon the subject of Chelonian respiration, it has been republished entire in the essay under notice. This procedure was adopted as an act of justice, moreover, to the singularly truthful views of Townson, which are but little known, and where known are either unappreciated or condemned as erroneous. From this brochure we derive the following facts.

In the frog-tribe, as is well known, the absence of ribs and a diaphragm necessitates a departure from the mammalian type of respiration. In the turtles the diaphragm is absent also, while the bones of the trunk are quite immobile. Blasius, indeed, asserted the existence of the diaphragm, but Gotwald, Wallbaum, and the French academicians were unable to find it. Townson also sought for it in vain. In consequence of this deficiency of the requisite mechanism for respiration Perault was led to attribute the expansion of the lungs and consequent inspiration to the elasticity of the membranes forming their cells; and the expiration to muscular compression. Varnier thought that the process of respiration was effected by the muscular texture of the lungs themselves. Tauvry and Haro maintained that turtles breathed only while walking. Townson by two simple and conclusive experiments showed the fallacy of this opinion. Morgagni supposed that the tortoise respired like the frog, and in this opinion he was supported by some observations of Coiter and Varnier. Townson combats this idea with vigour, and gives us the following explanation:—

"My attention was soon called to observe the structure and office of some muscles in the region of the flanks, which I observed often to be in motion, contracting and extending alternately, and though placed by the side of the hind legs, these were not moved by them. Further, they were placed at the end of the last lobule of the lungs, and they appeared to retain their irritability the longest. This was sufficient to lead me to conjecture that these might be the parts by which respiration in these animals was performed; and to see them act in their natural position I sawed off, in another tortoise, that part of the shell which covers them, and I then saw them constantly working. One was now placed nearly in a perpendicular direction, and another, or part of the same, was placed nearer the sternum, lying almost in a horizontal direction. The first in its contraction, receded from the testa inwards, whilst the latter, in its contraction, observed a contrary direction. When I attributed to them the office of expirator and inspirator muscles, which I supposed them to perform, I was embarrassed, because I could not conceive how a muscle could be a constrictor with its convex side; yet when the expirator, by contracting, had receded from the shell inwards, it appeared, when viewed from without, to be concave. But this difficulty ceased as soon as I had opened the animal and dissected the parts, for I then found the following admirable contrivance of nature. This part is composed of two distinct muscles, with their risings and insertions quite different, yet firmly connected in the middle by cellular membrane. The first rises from the testa near the spina dorsi, and is inserted into the peritoneum; this is the constrictor of the lungs, or the muscle of expiration. The other is nearly spread over the whole cavity between the upper and under shell, where the hind legs are drawn in during the contracted state of the animal, being inserted into the margin of the testa above, and the margin of the sternum below. The places of insertion of these muscles, and their connection in the middle being known, there is then no difficulty in explaining why the muscle, while acting as a constrictor, appeared concave, as it was only the inspirator brought into that position by its antagonist; nor any difficulty in conceiving how they carry on the function of respiration; for the expirator being connected, as I have already said, to the testa below and to the peritoneum above, envelops in a manner the last movable lobule of the lungs; when, therefore, it contracts, it compresses this part of the lungs, and by that means expels the air; then ceasing to act, the other contracts, and draws the former with it, thus a vacuum is formed, into which the air rushes, as in the respiration of those animals which have a thorax.

"To prove that this explanation was well founded, and that the motions of these muscles were really those of respiration, I made the following experiment. I fastened on the nose of a tortoise a little valve made of white paper, which covered the nostrils, and with the assistance of a friend, I watched the motions of the soft parts lying within the hollow where the hind legs came out, and I found that these motions perfectly corresponded with the motions of the valve, which was put into motion by the expirations and inspirations of the animal. In this manner I conceive respiration to be carried on in the tortoise, without, however, meaning to extend this explanation to the whole of the genus Testudo, some families of which I have never yet had an opportunity to examine. These animals will therefore materially differ from those of the two preceding families in the mode of respiring; the air in them being driven into the lungs by the muscles of the throat, which act like a pair of bellows, whilst in these it is performed by the lungs following the motions of their containing parts, and they will therefore differ from the animals having a thorax chiefly in the form and situation of the parts."

In 1819 Bojanus published an important work on the anatomy of Testudo Europæa, in which the inspiratory muscle and the posterior belly of the expiratory muscle are grouped as abdominal muscles. In his *Leçons d'Anatomie Comparée*, Cuvier asserts that inspiration is effected by the alternate contraction and dilatation of the throat, which are movements of deglutition. According to Dumeril and Bibron, air enters the buccal cavity through the nose, then the fleshy tongue is applied to the posterior nares so as to close them, and the mylohyoid floor of the mouth contracts to force the imprisoned air into the lungs.

As long ago as 1719 Malpighi and his contemporaries described the respiration of turtles as similar to that of frogs. Muller, Carpenter, T. Rymer Jones, Milne Edwards, Agassiz and others have, one after the other, reiterated this opinion.

From the paper under consideration we learn that—

"In the summer of 1861, Dr. Weir Mitchell, while engaged in studying the blood-pressure in the snapping turtle, Chelydra serpentina, became convinced that the prevailing views as to the respiratory mechanism of Chelonian reptiles were totally incorrect. Accordingly he partially studied the subject, and incidentally embodied his opinions in an essay upon the blood-pressure in the snapping turtle. At the time referred to, Dr. Mitchell was unacquainted with Townson's researches. The views of Dr. Mitchell, and the experiments by which he supported them, will be found scattered through the text of the present essay, of which, indeed, they form the basis. In the summer of 1862, the present authors took up anew the study of the respiration in turtles, and have endeavoured to render it as complete as possible. In so doing they have been fortunate enough to carry the subject far beyond the crude experiments of Townson, and to discover anatomical and physiological facts of the utmost interest and novelty, which have hitherto escaped attention."

Our limited space will not permit an extended account of the experiments and observations of Drs. Mitchell and Morehouse. While we refer our readers to the paper itself for many interesting details, we must content ourselves with furnishing in this place a résumé of the more important results arrived at.

The physiological portion of the essay treats of, 1st, the externally visible phenomena of respiration; 2d, the physiology of the muscles of respiration; and 3d, the physiology of the respiratory nerves.

The respiratory process is thus described:—

"Turtles breathe easily with the mouth open or shut. This fact alone deprives their respiration of all resemblance to that of Batrachians.

"The respiratory process is threefold, and consists of—

"1. Complete expiration.

"2. Complete and very full inspiration.

"3. An appearance of slight, or partial expiration, followed by a pause of greater or less duration.

"During the period which precedes this series of movements, the turtle being at rest, the spaces between the posterior members and the plastron and carapace are nearly level, or only a little concave. The shoulders are pushed forward somewhat, the lungs being full at this time, while the large hyoid apparatus is

usually dilated or drawn backwards and downwards. Sometimes it is in continual motion, like that of the frog when breathing, but in the turtle this rise and fall of the hyoid arches has no essential connection with that function. When, during the inter-respiratory pause, we open the jaws, the same movements of the hyoid apparatus may still be seen, nor is it easy at these times to assign to them any very obvious purpose. The glottis may be seen at rest, as a linear slit, in the centre of an ovoidal slightly elevated mound, just back of the tongue, on the floor of the mouth. The first respiratory act is one of expiration. Whether the mouth be opened for observation or not, the following movements occur: The hyoid apparatus descends and broadens laterally especially at its posterior part, carrying the glottis back and a little down. The object of this action we suppose to be, the separation of the glottis from contact with the roof of the mouth, in order that the air may the more readily enter it after passing through the nares. At the moment of beginning to expire the glottis opens wide, so as to form a rhombic figure. It remains thus until the whole respiratory act is completed. Meanwhile, during expiration the limbs fall in towards the shell quite passively, and the flank spaces in front of the posterior limbs sink so as to present deeply concave surfaces.

"A full inspiration instantly follows. The flank spaces become flat and tense, rising to a level. The glottis remains open. The hyoid arches advance, and at the close of the inspiration the shoulders are pushed passively forward.

"As soon as the lungs are completely filled, a very slight expiration relieves them of the surplus air, the flank spaces sinking a little, the hyoid arch at rest, the glottis closing at the end of the expiration. The final action here described appears to be due to the cessation of activity on the part of the inspiratory muscles and to the passive falling in of the limbs displaced during their contraction. The lungs are thus left full of air, and ready for the next act of respiration. Whenever a turtle in air breathes, these triple actions occur, but when under water it occasionally expires air, and does not rise to renew the supply until some time has passed by."

In the following extract will be found the explanation, given by our authors, of the function of the respiratory muscles of the turtle:—

"A large snapping turtle was secured on its back, and an incision made over the flank space, between the posterior limb and the plastron and carapace. The skin and superficial fascia were then carefully removed so as to expose the whole muscle which fills this space, and which has already been fully described.

"When inspiration took place, the muscle contracted, and as it is possessed of a central tendon from which radiate fibres in all directions, the result of their shortening was to convert its previous deeply concave surface into one which was nearly level, while at the same time the air rushed through the open glottis into the lung. The analogy between this muscle and the diaphragm of mammals was absolutely perfect. The central tendon, the converging muscular fibres, and the form of movement resulting from this beautiful arrangement, all united to suggest the resemblance. The inspiratory function of this muscle was palpably evident, nor could any other office be possibly assigned to it, because it was attached to no movable bone or other parts susceptible of motion.

"Repeated galvanization of this muscle served further to demonstrate its purpose. Finally, the muscles on both sides were removed, when all inspiratory power was lost. The turtle could empty its lungs, but possessed no power to fill them anew.

"The muscles engaged in expiration were next made the subject of study. At first we were led to believe, that the elastic contractility of the lungs might alone suffice to empty them, but this was opposed to all physiological analogy, and the power with which expiration occurred was too great to allow us to suppose that no muscular force intervened for its production.

"To examine this part of the subject, a turtle (snapper) was secured, as usual, and the plastron removed, with the exception of a rim at the back and on each side, to which remained attached the fibres of the inspiratory muscles. After a few minutes the turtle expired the air in the lung. During this action, the fascia covering the lungs below, and lying between the peritoneum and the plastron, was observed to become tense, owing to the contraction of the two

sheets of muscle, which terminate this tendon anteriorly and posteriorly, and find origin in the carapace.

"Recalling the full anatomical description already given, it will be remembered, that the lungs and abdominal viscera are covered outside of, and below the peritoneal sac, by a white membranous tendon, which extends across the middle line, and is firmly attached to the pericardium, as well as by firm areolar tissue to the central line of the plastron or lower shell. The muscular bellies arising from this covering tendon, fold over the lung in front and behind. Opposite to the inspiratory muscles are also areolar fibres, binding its tendon to the fascia of the expiratory muscle above it. When the four bellies of this muscle, or muscles contract, the lungs are acted upon directly, or by being compressed through the medium of the other viscera which are, so to speak, grasped during this powerful movement. At the same time, the passive inspiratory muscles are drawn up with the retreating lungs, owing to the pressure of the external air, and to the close union between the two sets of antagonistic muscles. Although the pericardium is also fastened to the expiratory tendon, this sac is so firmly bound to the plastron below it, that it does not appear to be disturbed during expiration, unless the connecting fibres are divided, in which case the heart sac and its contents are strongly drawn from the plastron, as the air is expired from the lung.

"As in the case of the inspiratory muscle, the expiratory muscle was also tested by observing its action when exposed in the living animal, and by galvanizing its fibres. The purpose of this singular sheet of muscle and connecting tendon admits then of no doubt. Aided by the elasticity of the lung, it empties that viscus of air, and no other muscle appears to lend it any aid.

"The third period of respiratory movement is marked by the closure of the glottis, and by the relaxation of the muscle of inspiration, the limbs then settling passively to their new positions. Hence the general appearance of a slight expiration at the end of the inspiratory act.

"It is impossible to review this account of the respiration in chelonians, with out being struck with the simplicity of the plan. A box containing all the viscera of the chest and belly has an open space on each side, filled by a muscle of peculiar form, whose contraction increases the size of the visceral cavity, and thus causes air to rush into it. Within the breast-box, the lungs and visceral mass embraced by a single muscle, obey its contraction in effecting expiration, and as the visceral cavity thus becomes smaller, the inspiratory flank muscles curve in to fill the gap.

"After the most careful investigation, we can discover no other respiratory muscles within the breast-box.

"The muscular apparatus of the glottis is equally simple. There is a muscle to open it, and another muscle to close it. Here, as in the rest of this portion of our essay, we shall not commit ourselves by names, which, although they may recognize homologies, confuse the reader, who has sometimes to bear in mind that their functions may be exactly the reverse of those of the human muscle whose name they carry.

"The two glottic muscles have already been fully described; when both are cut away or paralyzed, by section of their nerves, the glottis still closes, owing to the elasticity of its cartilages, but it does not shut firmly, and if the lungs be previously filled with air, a large part always escapes. Under ordinary circumstances, the glottic lips are closely pressed together by the sphincter-like muscle which we have described and figured. The mass of its fibres lie below the opening muscle, and are parallel to the direction of the glottic lip, while its connections are principally at the anterior and posterior end of the glottic line. When contracted, as it always is more or less strongly during the interval between two respirations, it would tend to pucker the glottis somewhat, if it were not that the anterior and posterior insertion are firmly fixed, by the parts in front of and behind them respectively. Thus attached, the only influence it can exert, is to close the glottis whose lips stiffened by the arytenoid cartilages facilitate the process.

"The opening muscle lies outside of the closing muscle, nearly at right angles to it, and immediately under the mucous membrane of the glottic mound. At

the moment when expiration begins the respiratory act, this opening muscle contracts so as to draw the glottic lips wide open and permit the air to escape. Then follows a full inspiration, the glottis still open, and lastly it is closed by the constrictor muscle just after the great flank muscles of inspiration cease to act.

"The downward movement of the hyoid arches is effected by the omo-hyoid and other muscles of the neck. It appears to be intended to remove the glottis from contact with the roof of the mouth during the act of respiration. The upward motion of the hyoid apparatus is produced by a thin sheet of muscular fibres spread transversely across it and over the whole upper part of the neck.

"The function of all of the above muscles was determined by simple observation, by stimulating them directly, and by irritating their nerves."

With regard to the nerves employed in respiration the conclusions experimentally ascertained are, that the superior laryngeal nerves in turtles are the nerves of sensibility for the mucous membrane of the larynx and glottis; that they are the motor nerves of all the true glottic muscles, and enjoy thus the ability to open and to close this orifice; that the inferior laryngeal nerves are the motor nerves of the dilating muscles only, and have not sensibility or power to close the glottis; and that there exists a communication between the right and left superior laryngeal nerves, of the nature of a true chiasm, precisely like that of the optic nerves.

In concluding their paper, our authors bespeak attention for the following principal points as interesting novelties:—

"1st. In Chelonians the superior laryngeal nerve is distributed both to the opening and closing muscles of the glottis.

"2d. The inferior laryngeal nerve is distributed solely to the opening muscle of the glottis.

"3d. A true chiasm exists between the two superior laryngeal nerves.

"4th. The expiratory muscle lies within the breast-box, and consists of anterior and posterior bellies connected by a strong tendon continuous across the middle line, and common to both sides of the animal.

"5th. The inspiratory muscles occupy the flank spaces on either side.

"6th. Inspiration is effected by the contraction of the flank muscles, which in appearance strongly resemble the diaphragms of superior animals.

"7th. Expiration is effected by the consentaneous action of the four muscular bellies above described, which thus compress the viscera against the lungs. The act of respiration consists of an expiration and an inspiration, during which the glottis remains open.

"8th. The opening of the glottis is effected through the agency of the superior and inferior laryngeal nerves, both of which are distributed to the dilating muscle of the glottis. The superior laryngeal nerve presides over the closure of the glottis, being in part distributed to its sphincter muscle. The elastic contractility of the glottic cartilages aids in closing this orifice. After section of the superior laryngeal nerves, the glottis may still be opened by the agency of the inferior laryngeal nerves, its imperfect closure being then effected by means of the elasticity of its cartilaginous lips. The chiasm of the superior laryngeal nerves enables one of these nerves to open and shut the glottis after section or disease of the opposite nerve and of both inferior laryngeals.

"Physiologists have therefore been in error when describing the respiration of Chelonians as analogous to that of Batrachians, since it far more closely resembles the breathing of the higher vertebrates."

We cannot conclude this brief notice without expressing the earnest hope that investigations so interesting, and so auspiciously begun, will not be discontinued, but, on the contrary, prosecuted with vigour, until other and still more important results are obtained. J. A. M.

ART. XXIV.—*Diet for the Sick and Convalescent.* By E. NEAL, M. D., A. L. S., University of Pennsylvania. *Indocti discant, et ament meminesse docti.* 12mo. pp. 60. Philadelphia, 1861. James Challen & Son.

THE subject of diet in health and disease is one of the greatest importance. To choose properly the kind of food which is best adapted to sustain at its highest attainable grade the health and vigour and the capacity for endurance of the human organism in individuals of different ages, physical conditions, and pursuits in life, and to have it prepared for use in such a manner as shall, without impairing its nutritious properties, increase its palatableness and digestibility, requires the possession of a much larger amount of varied knowledge than would at first sight be supposed. To make a proper choice of a diet for people in health an acquaintance with the vital condition and physical strength, the nature of the occupation, and the average age of those for whom the diet is intended, with the average temperature of the climate they inhabit, the amount of active bodily labour they are called upon to perform, daily or at intervals, is essential. In addition to this there must be also an accurate knowledge of the nutritive properties of each of the several alimentary articles in common use, as well as the chemical changes which are induced in them respectively by the different modes of cookery and by the addition of certain spices. And still further, it is essential that the physiology of digestion, assimilation, and nutrition, and the building up and metamorphosis of tissue, should be well understood, in order to know how far any given class of alimentary substances are adapted to sustain the body, with all its component organs, in the required state of health and vigour. We need not be surprised, therefore, that in relation to almost every point connected with the subject gross errors are committed daily, even by those whose duty would seem to require of them an intimate acquaintance with it.

While the amount of knowledge to which we have referred is essential in order that the choice of an appropriate diet may be made for such as are in health, even still more is necessary when we come to choose a diet for the sick and convalescent. There must then be taken into consideration the condition of the digestive organs, during and immediately after an attack of disease, together with the object to be attained by giving or withholding any particular article or form of food under the circumstances of each case. This department of dietetics requires to be carefully studied anew under the increased lights which recent observations and a more careful series of investigations have cast upon it. Numerous popular errors are entertained in respect to the lightness and cooling properties, the digestibility and nutritive properties of certain kinds and preparations of alimentary matters, and their adaptedness, consequently, to patients labouring under, as well as to those recovering from, different forms of disease. These errors have been to some extent countenanced even by medical men, who, not unfrequently, have in consequence caused serious evil to be inflicted by their prescription to the sick and convalescent of an inappropriate diet.

The foregoing remarks have been suggested rather by the title than by the contents of the work before us. It is one of but little pretension. No attempt is made by the author to discuss the subject of diet generally, whether in its character of a sustainer of the health of the system during a state of entire health, of an assistant in the prevention and cure of disease, or as one of the means, and among the most important, for restoring the body to its normal condition of health and strength, after it has been prostrated by sickness. The leading, we might even say the only, object Dr. Neal appears to have had in view is to furnish a series of dietetic preparations for the sick and convalescent, arranged, with a view to their proper choice, under five heads—beginning with the least irritating, and gradually rising to the more nutritive and stimulant.

So far as the want of this limited kind of information in respect to the diet of the sick chamber shall be felt, the work of Dr. Neal will be found a useful and reliable manual. D. F. C.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *New Motor System of the Heart.*—Professor von Bezold, of Jena, states that he has, in the course of some researches on the motion of the heart, discovered a new source of motor nerves of this organ, which connect it much more intimately and importantly than the cervical sympathetic or even the par vagum with the cerebro-spinal system. The following results were arrived at by him from experiments on animals paralyzed by woorara. 1. When the pneumogastric and sympathetic nerves were divided in the neck, so as to cut off the hitherto recognized conduction of nervous influence from the central organs to the heart, irritation of the medulla oblongata produced a very marked increase in frequency of the pulse and an uncommon augmentation of the pressure of the blood in the arteries—the latter being sometimes more than doubled. 2. When, further, the spinal cord was divided in these animals at any point above the seventh cervical vertebra, the activity of the heart was almost immediately diminished: the pressure of the blood in the carotid was diminished to three-fourths, the beat of the heart became weak and its sounds almost inaudible, etc. On the other hand when the division was made in the neighbourhood of the third or fourth dorsal vertebra, no such effect was produced. Hence the centre of innervation does not extend below the fourth dorsal vertebra. 3. If, after dividing the cord above the seventh cervical vertebra, the medulla oblongata or the portion of the cord above the division be irritated, however violently whether mechanically or by electricity, no change is produced in the pressure of the blood or in the frequency of the pulse. But if the portion of the cord on the distal side of the division be irritated, the blood-pressure and the heart's action, which have been diminished by the section, may be raised to or even above the normal height. Hence the motor nerves (exclusive of the par vagum and cervical sympathetic) do not come off above the seventh cervical vertebra. 4. If, in partially poisoned animals, the medulla oblongata and the peripheric portion of the divided vagi be simultaneously irritated, the results are, not an increase, but a diminution, of the pressure of the blood; not an acceleration of the pulse, but a retardation or even cessation. Bezold derives the following conclusions from his experiments. *a.* He believes he has ascertained the existence of a new central organ for the motions of the heart, having its seat neither in the medulla oblongata nor in the brain. *b.* Its fibres run through the cervical spinal cord, and pass out between the seventh cervical and fifth dorsal vertebræ. *c.* They very probably pass through the lower cervical and upper dorsal sympathetic ganglia, and enter the breast as the lower and middle cardiac nerves. *d.* This central motor organ normally furnishes three-fourths of the entire propulsive force of the heart; when it is abnormally irritated, the energy of the contractions of the heart may be increased sixfold. *e.* This cardiac

nervous system, apparently having its seat in the medulla oblongata, stands in a reflex connection with the sensory cerebro-spinal fibres. *f.* Various poisons, especially digitalis and strychnia, increase and strengthen the heart's beat, after division of the vagus, by increasing the irritability and activity of this cerebro-spinal cardiac nervous system.—*British Med. Journ.* of Feb. 1863, from *Berlin Med. Centralzeitung*, and *Wiener Med. Wochenschrift*, Dec. 20, 1862.

2. *Physiological Anatomy of the Lungs.*—Dr. NEWTON HEALE read before the Royal Medical and Chirurgical Society a paper on this subject.

The following points in connection with the physiological anatomy of the lungs have been elicited as the result of investigations made by the author:—

First. As regards the pleura.

Certain longitudinal channels are to be found in it. These are pervious to air, and are connected with the minutest air-passages in the substance of the lungs by means of tubular passages in the subpleural cellular tissue. They are surrounded by a vascular plexus, derived from the pulmonary system of blood-vessels.

Second. As relates to the manner in which the air is distributed throughout the lungs.

A remarkable difference is to be noticed in what is ordinarily called the bifurcation of the trachea as it exists in the human subject contrasted with that of other mammalia. In the latter a large trunk is given off from the windpipe before it reaches the spot which is usually called its bifurcation. This trunk goes to the upper part of the right lung. The left bronchus is therefore, in those animals, the second alternate branch which proceeds from the main air-pipe. Each bronchial tube, instead of splitting up equally into lesser tubes, and thereby forming a dichotomous or a trichotomous division, passes towards the margins of the lobes in a continuous direction, though diminishing in size. It gives off its branches in an alternate manner, and each of the subordinate tubes pursues a similar course. When they have arrived at a certain degree of diminution, a set of membranous tubes, differing in some respects from the bronchial tubes, and also from the air-cells, but being intermediate in character between the two, are sent off from the terminal bronchial tubes. To these membranous tubes the author attaches the name of pedicles. The true pulmonary tissue is quite distinct in its anatomical peculiarities from those of the bronchial tubes, however small these may be. It does not at all resemble them, and they cannot be mistaken the one for the other. The ultimate parenchyma of the lungs is made up of little bodies, to which the author attaches the name of "leaflets." The pedicles connect the terminal bronchial tubes with the leaflets; and many pedicles from different terminal tubes enter into each leaflet. This peculiarity in the leaflets causes a very minute anastomosis to take place between the different bronchial tubes, which could not occur if the ordinary description were correct.

Third. The author does not profess to have contributed any fresh facts relating to the lymphatics or to the nerves as to their purely anatomical characters.

Fourth. With reference to the characters and functions of the so-called bronchial arteries.

The author prefers to give the name of sustinent arteries and veins to the bloodvessels usually denominated bronchial. He considers that the latter word implies that they have some peculiar relation to the bronchial tubes, and more especially to the bronchial membrane, which is a destination usually attributed to them. They have in consequence been supposed to be the vessels peculiarly engaged in the pathological condition known as bronchitis. The author's investigations show that every sort of vascular action throughout every part of the lungs, by which any damage to its tissue is remedied, is accomplished through the sustinent vessels exclusively, although the peculiar plexus by which the whole of the mucous surface is covered, and by which the bronchial mucus is supplied, is not in any degree contributed by the so-called bronchial arteries. Physiologically and anatomically, the sustinent and pulmonary systems are quite distinct. While the duty of repairing the tissue of every part of the lungs devolves upon the sustinent vessels, that of bringing the venous blood

furnished by the right side of the heart into contact with the air, and of accomplishing the physiological purposes which are aimed at by that arrangement, is intrusted solely to the pulmonary vessels. The purpose for which the vascular plexus is spread out in the mucous membrane is entirely connected with the atmospheric influences, and the large surface which that membrane affords for the furtherance of that object is thus turned to account, and the plexus itself is consequently in exclusive relation with the pulmonary system of bloodvessels. Modern authors, with the exception of Dr. Harrison, of Dublin, concur in believing that there is some kind of anastomosis between the minute branches of the pulmonary and sustinent vessels. That gentleman with great truthfulness and candour, acknowledges that he has not been able to satisfy himself that the presumed anastomosis has not been the result of the rupture of one or both sets of vessels in the act of injecting them.

The author of this paper has found that the vasa vasorum of the pulmonary vessels are supplied entirely by the sustinent arteries; and that when the latter have been fully distended, and some degree of violence has afterwards been used, the minute capillaries in connection with the sustinent arteries which are spread over the interior of the walls of the larger pulmonary vessels have sometimes been made to burst, and a false communication into the canal of one of the pulmonary vessels has thus been made. A channel for the injection having been once established by an accident of this nature, it becomes gradually enlarged in proportion as the injection is afterwards made to flow through the rent, and an unlimited quantity of injection may then be made to flow through the artificial passage. The pulmonary and sustinent vessels cannot be made to communicate with one another by any other means than this.

It has been a disputed point as to whether the so-called bronchial arteries are furnished with veins. It is, however, easily shown that sustinent veins accompany the bronchial tubes, returning the residual blood supplied by the sustinent arteries to the internal parts of the lungs; and that other sustinent veins ramify in the subpleural tissue, which collect the blood from the exterior of those organs.

Attention is called to the fact that the sustinent veins are furnished with valves, and with cross branches of anastomosis. These last facts are of some importance, not with regard to the lungs only, but also with reference to the bloodvessels, which discharge in other viscera a function similar to that of the sustinent arteries.

Fifth. As relates to the distribution of the pulmonary vessels.

Modern authors describe the *pulmonary arteries* as accompanying the bronchial tubes; as continuing to divide again and again, becoming more numerous than the tubes; as giving off branches of supply to the various tissues; as anastomosing with the so-called bronchial arteries; and their residue as being ultimately distributed to the air-cells. The author considers this account to be far from accurate. He finds that the pulmonary arteries never give off branches of supply to *any* tissue. They never form any anastomosis either among themselves or with any other bloodvessel. They do not become more numerous than the bronchial tubes, since each of these is accompanied by one, and never more than one, pulmonary artery, which pursues in relation to it a perfectly definite and invariable course; and the final distribution of every portion of the pulmonary artery, down to the minutest fragment, is precisely and entirely alike. The whole of it is split up so as to form the remarkable anastomosing plexus in the leaflets. The pulmonary *veins* commence in the interior of the leaflets by *tufts* of capillaries. The veins formed from these commencements are placed, in the first instance, at some distance from the bronchial tubes; but as they increase in size they come into contact with them. A remarkably vascular plexus, composed exclusively of pulmonary vessels, occupies the whole surface of the mucous membrane. This is derived as an offshoot from the plexus in the leaflets, and is reinforced in the larger tubes by bloodvessels furnished from the leaflets which cling to the tubes externally, and send perforating branches to the plexus in the membrane. Some *ramusculi* are also placed externally to the tubes. They collect the blood from the plexus in the membrane, and convey it to the larger pulmonary veins, the formation of which has

been described above. There are, therefore, in the first instance, two distinct sets of minute pulmonary veins. One of these, after leaving the leaflets, makes its way at once in a direction towards the left auricle, without undergoing any further exposure to the air. The other is spread over the mucous membrane, and derives the benefit of the atmospheric influence which the surface of that membrane affords, and ultimately joins the other portion. The anatomical distribution of the pulmonary vessels indisputably proves that their physiological function is exclusively in relation with the air supplied by the bronchial tubes, and that it is totally independent of any purpose having relation to the construction or repair of any part of the *tissue* of the lungs.

(The paper was accompanied by numerous drawings and diagrams.)

Dr. Heale, at the request of the President, drew attention to the apparatus which he employed. He showed that in injecting the pulmonary arteries and veins with different colours both should be injected simultaneously, so that the two fluids should meet in the capillaries. If the arteries by themselves were injected first, the fluid passing through the capillaries into the larger vessels beyond would prevent the proper injection afterwards of the veins, and *vice versâ*. He showed that no anastomosis existed between the so-called bronchial vessels and those of the pulmonary system, as the capillaries of the first could be injected in every part of the lungs without any of the injection reaching any of the other vessels. In speaking of the distribution of the air to the tissue of the lungs, he mentioned that a very free anastomosis was established between the air contained in different parts of the lungs after the bronchial tubes had reached their minutest subdivision. Dr. Heale gives the name of pedicles to the smallest of the bronchial tubes, and that of leaflets to the ultimate subdivisions of the pulmonary tissue. He showed that there was a complex inosculation between different leaflets and pedicles. The equal diffusion of air throughout the lungs is further provided for by tubular passages which ramify in the subpleural and interlobular cellular tissue, and communicate with longitudinal channels in the substance of the pleura. Passing to the physiological points involved in the various anatomical details, he remarked that it was usual to speak of respiration as one thing, of circulation as another, and of nutrition as a third; but that in point of fact all three were parts of one and the same physiological operation, and that it was as impossible that the circulation or the nutrition should go on independently of the respiratory processes as that the hands of a watch should continue to point the hour when the mainspring was impeded in its action. Dr. Heale then explained at some length his views with regard to the heart's action in effecting the circulation of the blood, the physiology of respiration, &c.

In answer to a question from Dr. Lee, Mr. Heale stated that he had been engaged during the last two years in dissecting the ganglia and nerves of the lungs, and that in these dissections a great system of ganglia and nerves was displayed throughout the lungs; and he considered that without taking into account these nervous structures of the lungs the functions of those organs could not be explained.—*Med. Times and Gaz.*, May 30, 1863.

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3. *Fœtus born without Heart, Brain, Lungs, or Liver.*—Dr. Wm. H. DICKINSON read before the Royal Medical and Chirurgical Society (May 12th, 1863) a description of a monster of this kind.

This being, like all others of the same character, was a twin. Both umbilical cords were attached to a single elongated placenta. The imperfect fœtus was devoid of any vestige of head or neck. The upper extremities were present, but were in some respects imperfect. On the anterior surface was a small prominence, which appeared to represent the tip of the tongue. The umbilical cord was surrounded at its fœtal extremity by a small membranous bag, which contained a coil of intestine. The lower extremities were only slightly different from their usual state. The body was generally swollen and œdematous. The spinal column was deficient from the second cervical vertebra upwards. No trace of any cranial bones could be discovered. The clavicles were absent. The integuments were of unusual thickness, owing to a general infiltration of serous fluid. In the cavity of the trunk lay the lower two feet of the intestine,

which commenced by a cæcal extremity, and two large kidneys. The ureters, the bladder, the urachus, and a pair of undescended testicles were found in their normal relations. The other viscera were absent. The umbilical cord contained a large vein and artery. The artery divided on entering the belly into two large branches, one of which passed into the right thigh and side of the pelvis. The other division served for all the rest of the body. It swept upwards to the position due to the aorta on the left side of the spine, and gave off vessels for the left thigh, for the left side of the pelvis, and for the kidneys. It terminated between the shoulders by dividing abruptly into two large branches, which went to each upper extremity. The veins were arranged in an almost parallel manner. There was no communication between the two sets of vessels corresponding to the foramen ovale. The entire encephalon and the upper part of the spinal cord were wanting. The sympathetic ganglia were large, but not numerous. A chain of eight lay along the side of the vertebral column. Numerous filaments maintained the connection between the sympathetic ganglia and the spinal nerves.

Since there was no communication between the veins and arteries of the fœtus answering to the foramen ovale, but the veins throughout the body were simply continuous with the umbilical vein, and the arteries with the umbilical artery, it was inferred that either in the cord or in the body of the monstrosity the usual direction of the blood must have been inverted. If it passed, as usual, from the mother down the umbilical vein, then it must have been continued into the tissues by the veins of the fœtus. On the other hand, if the course of the circulation was not thus reversed in the fœtus, the artery of the cord must have brought the supply from the placenta.

This question was discussed, and the author finally adopted a suggestion of the late Dr. Young, which had been worked out by Sir Astley Cooper, that the circulation in such monstrosities is due to the impulse of the heart of the healthy fœtus, which always accompanies them, and which is conveyed through anastomosing vessels between the two cords upon the surface of the common placenta. The blood thus reaches the imperfect fœtus through its umbilical artery, and is thence distributed to its tissues.

Mr. Savory said, cases like the one just related were especially interesting with regard to the forces concerned in the circulation of the blood. He believed it was now generally accepted that the heart was not the sole agent in the movement of the blood. Of the other forces employed, that which was generated at the capillaries was assuredly not the least. But cases like the present one confirmed this doctrine; for in this, as in some others, especially the case recorded by Houston, it seemed almost impossible, after a careful study of their anatomy, to arrive at the conclusion that the heart of the healthy child was sufficient to maintain, not only its own circulation, but that of the monster also. These cases, he thought, might be profitably studied by the light of comparative physiology. Just as in the lower vertebrata—as in fishes—where the small and single ventricle seemed manifestly insufficient to accomplish unaided the circulation through the capillaries of gills and system; just as in some of the lowest of the invertebrata, where, as in plants, the movement is maintained without a heart of any kind: so in these monstrous forms among the highest we must more clearly recognize, in the absence of a heart, the existence of independent forces to circulate the blood.

Dr. Heale called attention to the fact that there must be some force acting on the circulation in the capillaries distinct from that of the heart's pulsation, in order to remedy after each pulsation the distension of the bloodvessels, which would otherwise remain in a state of maximum distension, and be unable to yield any longer to the ensuing pulsation. This force, which empties the capillaries, must be quite as real and important as that which distended them. The changes which occurred during these intervals were precisely those for which the pulsation was calculated to furnish the materials, and they embraced all the strictly vital operations which occurred both in the pulmonary capillaries and in the system at large, and the two balanced each other with the greatest exactness. For, supposing it possible (which it is not) that one or the other should preponderate, the blood would immediately become either too arterial or too

venous, as the case might be—a state of things which would necessarily be corrected in the very next pulsation. The heart's action therefore became auxiliary to the action of the capillaries. The placenta of the fœtus accomplished for it precisely what the lungs did for the adult. The difficulty of explaining how the circulation might have been carried on in the acardiac fœtus was materially lessened by these considerations.

Dr. Dickinson, in reply to the remarks of Mr. Savory, allowed the possible existence of a force which promoted the circulation of the blood independently of the action of the heart. In vegetables the circulation was carried on by this alone; but the higher in the animal scale, the more active the circulation and the more necessary the heart. It could not be supposed that in the human fœtus the circulation could be maintained without this organ. It was almost proved that the circulation depended on the heart of the other twin by the fact that in every case of acardiac monstrosity not only was the monster a twin, but it was attached to the same placenta as served for the other child. If the circulation depended on forces within its own body, there could be no reason why it should not be carried on without this connection.—*Lancet*, May 23, 1863.

MATERIA MEDICA AND PHARMACY.

4. *Effect of Tobacco Smoking upon Pulsation.*—DR. EDW. SMITH relates (*Lancet*, March 14, 1863) some experiments to determine the effect of tobacco smoking upon the rapidity of the pulse. These experiments are limited, but Dr. S. thinks that they suffice "to show that tobacco acts variously upon different persons, and that there are those in whom it increases the action of the heart in an important degree. This difference must be sought for in the mode of smoking, the quantity of tobacco consumed in a given time, the reputed strength of the tobacco, and the habits and temperament of the smoker; and upon these questions I would offer an observation or two, with a view to further inquiry.

"1. *The mode of smoking.*—I do not smoke, but I have very carefully tested the mode of smoking, and agree with those who affirm that in ordinary circumstances the tobacco smoke is not mixed with the air in inspiration and carried into the lungs. The position of the throat is that which occurs in ordinary breathing through the nose—viz., the soft palate falls down, and the tongue is raised, so as to cut off the communication between the mouth and the throat. The two acts do not necessarily take place simultaneously. Whenever, as by an accident, a little tobacco smoke is inhaled, the smoker is at once conscious of irritation or choking in the throat, probably followed by cough. If any one have doubt upon this matter, let him endeavour to smoke with the nostrils closed and he will find the act impossible; but it may yet be possible that in cases in which affections of the throat are found in smokers the act may be performed carelessly, or from some cause the tobacco-smoke may frequently touch the pharynx. If the tobacco-smoke be not thus taken into the system, in what manner are the effects upon the pulse induced? It must be chiefly through solution in the saliva, which is then partly absorbed by the absorbent vessels, and partly swallowed, and thus introduced into the system. Whether frequent spitting would prevent or lessen the action needs to be further tested, but within limits it is probable that it would lesson it.

"2. *The quantity of tobacco consumed in a given time.*—In pursuing the inquiry it will be important to aim at uniformity in this respect, and direct that the act be nearly constantly performed so that the smoke may not escape from the open bowl, and that an ordinary bowlful be consumed in 20 minutes. Although it did not appear from Mr. D——'s experiments that rapidity of smoking varied the result, we must remember that the effect of the tobacco upon the pulse had then already been attained, and he is conscious that rapid smoking would make him ill, whilst smoking at the ordinary rate would be agreeable.

"3. *The strength of the tobacco.*—Smokers speak of strength of tobacco in two senses. Those accustomed to the fancy kinds of tobacco assert that the common shag or Virginian tobacco would make them ill, and also that certain tobaccos taste hot in the mouth. These two statements may probably refer to the two principal constituents of the tobacco—viz., the narcotine, which is so powerful a poison, and the empyreumatic oil, which would cause irritation of the mucous membrane of the mouth; and it is certain that, whilst the wholesale dealers in tobacco find many of the present fancy tobaccos in the same hogshead produced from the same soil, there are also diversities in the constituents of the tobacco, grown under different climates, upon different soils, and prepared for the market in different manners. I believe that with smokers in general the idea of strength is much more the effect upon the mouth than upon the general system. In the experiments referred to, the strong Bristol bird's eye had no more effect upon the pulse than the so called milder forms. It is probable that smoking is very much a gratification rather of the palate than of the sensorium.

"4. *Habits and temperament.*—Both Mr. D—— and Dr. H—— were well inured smokers; but, as we have seen, the effect upon them was well marked. Dr. H—— is beyond comparison more sensitive in temperament than Mr. D——, and yet the effect of tobacco upon him was much less. Hence, in reference to this action upon the pulse, neither of these conditions can be accepted as grounds for variation in the effect.

"I have referred in this paper to the action upon the pulse only, and not to the supposed sedative action upon the system generally, both because such an action is quite new to us, and because it is the only one of the two which can be well defined; but I do not for a moment wish to be understood to mean that this general action does not exist. It is, however, now impossible to look upon a dreamy state, a semi-narcotism, as the essential one of tobacco smoking: for when the pulse is excited in the manner now shown, the action is one of stimulation as perfect to appearance as if induced by food, and as fitted temporarily, and under proper conditions of food, to excite the activity of the brain or other organs. If the experience of literary men has shown that in some the necessary activity of brain is obtained only after the exhibition of strong wines and spirits, it may now be proved that in certain persons tobacco-smoking produces a similar result, and by quickening the pulse, and in a certain degree filling it also, it may excite all vital actions. In such a state of atonicity of system, when tobacco produces the effect upon the heart already described, it is easy to believe it a remediable agent of great value. But if there be not a state of atonicity, but on the other hand a tendency to fulness of system, what so certain as that this important action upon the heart must lead to disturbed sleep and conditions tending to apoplexy?"

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5. *On Cinchonine as a Substitute for Quinine.*—Dr. W. F. Daniell, of Kingston, Jamaica, writes to Professor Bentley as follows:—

"In the *Pharmaceutical Journal* for February last, I observe an interesting paper by Mr. Joseph Ince, recommending the salts of cinchonine in lieu of those of quinine; now so far as my experience extends with reference to the employment of cinchonine in the treatment of febrile and other miasmatic diseases of Western Africa, it has proved a decided failure, owing to the headache which has uniformly attended its administration. When I was in medical charge of the troops in Sierra Leone, a large quantity of cinchonine was furnished to the hospital with the view of testing its remedial properties, and also of ascertaining whether it would not answer as an economical substitute for quinine. It was therefore given to both European and negro patients who were suffering under the milder forms of remittent and intermittent fevers, and free from any local congestions, in the ordinary doses in which the sulphate of quinine was used. The results of the trial were, however, of such an unsatisfactory character, from the pain and cerebral congestion induced, that the medicine had to be discontinued. It was subsequently combined with calomel and morphia, but without any sensible diminution of the cerebral disturbance. When conjoined with the latter, delirium sometimes sets in, which was only

relieved by the application of blisters to the neck. With these drawbacks, therefore, cinchonine can never be resorted to as an efficient substitute for quinine in the treatment of tropical diseases."

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6. *Assimilation of Lactate of Iron, and its Superiority over the other Chalybeates in reference to Digestion.* By A. CORDIER, M. D.—In order to appreciate the different preparations of iron, their action on the gastric juice has of late been the subject of frequent consideration, and rightly so, as it was to be determined whether the gastric juice, by dissolving the chalybeates or combining with them, would not be found wanting in its proper place and time, the act of digestion. Meanwhile, we have, like the majority of the profession, continued to prescribe the lactate of iron, as the safest preparation in point of digestion.

Indeed, since 1839, when MM. Gelis and Conté presented their first paper to the Imperial Academy of Medicine, the lactate of iron has continually risen in the favour of the profession, and as clinical observation has more than sufficiently proved its eminent value, we feel much satisfaction in supporting this opinion by some new physiological facts and experiments.

That the lactate of iron is the only chalybeate which can be prepared in the human body is easily proved, by digesting for twelve hours at a temperature of 104° some iron filings with distilled water and calf's rennet. Hydrogen is disengaged and lactate of iron formed, because lactic acid is contained in the gastric juice, and in fact is that acid, which imparts to the same its acidity. This has been proved to evidence by MM. Claude Bernard, Barreswill, Chevreul, Leuret, Lassaigne, and others.

Besides, M. Bernard has shown that the lactate of iron can be injected into the veins in large quantity without producing any accidents—an experiment speaking highly in favour of MM. Gelis and Conté's preparation. (*Archives de Médecine*, vol. xvi. page 87.)

The lactate of iron combines itself readily with the albuminous fluids, and loses the property of being precipitated. (Mitscherlich, Bernard.) Those combinations are readily assimilated without fatiguing the stomach. Unlike other chalybeates, the lactate of iron, far from impeding digestion and weakening the appetite, rather strengthens them, as it has also been stated by M. Bouillaud in his report on the lactate of iron to the Imperial Academy of Medicine. MM. Fouquier and Hardy, in a note annexed to this report, say: "We have several times prescribed the pastils of lactate of iron in cases of chlorosis with amenorrhœa, and after three or four days there was always such an increase of appetite that the patients complained of the insufficiency of their diet," &c. &c. Experience has now sufficiently proved not only the excellence of MM. Gelis and Conté's pastils in all cases where ferruginous preparations are required, but also their superiority over other preparations, where a weak or diseased stomach has to be taken into consideration. The reason of this is partly intelligible from the above remarks; but there are other proofs which we will presently consider.

In experimenting on the digestibility of medicines, M. Quevenne has found that a dose of thirty grains of reduced iron, or of the sesquioxide, even when taken at meals, produces diarrhœa and vomiting, while the lactate administered eight times, at a dose of fifteen to thirty grains, produces no inconvenience; thirty grains only appeared to affect the animals experimented upon. This difference appears to be due to the stomach having in the first case to dissolve and transform into lactates the above-named preparations of iron, while in the latter case it receives the lactate already formed. If the stomach of healthy animals is differently affected, how much more will this be in the case of a reconvalescent or a chlorotic patient?

Recent experiments have given new support to the view which we hold of the preference to be given to the lactate over other less soluble preparations. M. Felix Boudet undertook a series of experiments to ascertain whether the salts of iron which are precipitated on contact with the gastric juice require for their absorption any considerable quantity of this valuable and important liquid. (Report on the Therapeutic Use of Pyrophosphate of Iron, read before the Imperial Academy of Medicine, July 13, 1858, &c. &c.) He says: "My experiments were made with the assistance of MM. Roubiquet, Corvisart, and

Boudault, who themselves are occupied with a general work on the relation and reaction between the gastric juice and a large number of drugs."

One drachm of fibrin and two and a half of fresh gastric juice of a dog mixed and kept for six hours at a temperature of 104°, the fibrin is dissolved and completely transformed into albuminose. But if one introduces at the same time any substance antagonistic to the action of the gastric juice, the fibrin is not or only partially digested.

In order of ascertaining the degree of digestion, MM. Boudault and Corvisart apply three consecutive tests: 1st. Boiling. 2d. Barreswill's liquor. 3d. Glucose added to Barreswill's liquor. If digestion has been completed, the obtained produce does not coagulate at 212°, turns into deep violet when boiled with Barreswill's liquor, and prevents this liquor to be reduced by glucose.

But if digestion has not taken place, the obtained produce is not turned into violet by Barreswill's liquor, and glucose readily reduces the liquor.

In case of incomplete digestion, the above tests are less marked one way or the other. These tests have been applied by me to different compounds of iron, of which in each case I employed so much as to represent three-fourths of a grain of metallic iron. The result has been—*with lactate of iron*, DIGESTION COMPLETE; consequently no modification of the action of the gastric juice by its presence. *With tartrate of iron and potash, citrate of iron, pyrophosphate of ammonia*, DIGESTION NULL; *with three-twentieth grain of reduced iron*, COMPLETE; with six-twentieth, INCOMPLETE DIGESTION.

Experiments with the pyrophosphates of iron and soda appear to have an equally paralyzing effect on the gastric juice. The same results had been obtained by MM. Boudault and Corvisart in previous experiments.

So besides clinical observation, chemistry and physiology have testified to the superiority of the lactate of iron, which has since a long time, and mainly through the pastils of MM. Gelis and Conté, proved itself to be the most digestible of all ferruginous preparations.—*Dublin Med. Press*, March 4, 1863.

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7. *Picronitrate of Potash as a Vermifuge.*—Some months ago Dr. FRIEDREICH, of Heidelberg, described, in Virchow's *Archiv*, the beneficial effects of picronitrate of potash in cases of trichina. The remedy has also been employed in tænia. Dr. WALTER, of Offenbach, relates the case of a woman aged 30, who had *tænia solium* for several years. During fifteen months he had employed all known remedies for tapeworm, including the bark of the root of the pomegranate, considered by some as infallible. On November 15, 1862, he gave the patient five pills, each containing five *centigrammes* of picronitrate of potash. On the 20th, an entire worm was expelled with the head. Four days after taking the medicine, the patient presented a jaundiced appearance.—*Dublin Med. Press*, May 27, 1863, from *Archiv. fur Pathol. Anat. und Phys.*

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8. *Permanganate of Potash as a Disinfectant.*—Dr. PLOSS speaks in the highest terms of the disinfecting power of this substance. It effectually removes all smell from the most stinking suppurating sores and discharges. Most remarkable results of this kind have followed its injection, repeated several times a day, in cases of cancer of the uterus—half a drachm to 8 ounces of distilled water being a good proportion. In the case of open wounds and ulcers, all the dressing covering them should be moistened with the solution. No means succeeds more rapidly than this in removing the disagreeable smell of the hands after the performance of autopsies, for which purpose a stronger solution (ʒss ad ℥j) may be employed. It is far superior to chlorine in its effects, which are not, as is the case with that substance, fugitive. For this reason it is a superior prophylactic, applied to the hands of accoucheurs, to chlorine in puerperal fever. In ozæna it is strongly to be recommended, the solution (℈ss ad ℥viiij) being introduced into the nares by means of a caoutchouc syphon. In bad smells of the mouth, resulting from carious teeth, it is an admirable means, a little cotton wool being moistened in a weak solution. Finally, the permanganate is to be recommended as a wash for stinking feet. This remedy deeply stains linen it comes in contact with, but the spots may be removed by means of the sulphate of iron.—*Medical Times and Gazette*, May 30th, 1863, from *Varges' Zeitschrift*, N. S., vol i.

9. *Uses and Value of Galvanism and Electricity in General Practice.*—Mr. HARVEY LOBB read a paper on this subject before the Harveian Society (Feb. 19, 1863). He commenced by stating that it was not to be supposed that galvanism was only useful in the hands of the specialist, but that there was a wide field open to its use in general practice; and after some remarks upon the resemblance of the nerve and galvanic currents, proceeded to describe the apparatus he recommended for general use, consisting of, first, the electro-magnetic and magneto-electric machines for producing energetic interrupted currents, for stimulating and revulsive effects; and, secondly, the Pulvermacher galvanic battery for the generation of the continuous galvanic current. These are all that is necessary for general practice, producing the ordinary results in electro-therapeutics, and can be highly recommended for their portability, cleanliness, and non-liability to get out of order. Mr. Lobb then demonstrated the action of each apparatus, describing the necessary conductors, and their application to the eye, the teeth, the uterus, the muscles, nerves, etc. He also described the method of employing the electric bath as a general stimulant, stating how valuable electricity was in diagnosing the seat of obscure diseases; that frequently the organ in fault was found to be quite remote from the suspected one. He gave the following explanation of the term "Faradization," now frequently met with in the writings of medical electricians: "The term Faradization was applied by Dr. Duchenne, of Paris, to the application of electricity derived from the secondary or finer wire of the electro-magnetic battery to the treatment of disease, out of honour to our distinguished countryman, Professor Faraday, who observed that whenever an insulated wire was brought within the influence of a wire along which a current of electricity was flowing from the positive to the negative plate of the voltaic battery, a current in the opposite direction was induced in the secondary wire of a higher degree of intensity than the current in the primary wire. Making use of this fact in conjunction with the previously-discovered one, of the increase of intensity caused by winding the insulated wires in a helix round a core of soft iron, the electro-magnetic battery was invested, and it is the application of the induced current derived from the secondary or finer wire of this battery to which the term 'Faradization' has been applied." Mr. Lobb then proceeded to the therapeutics of galvanism, first explaining the great value of electricity in all cases of chronic rheumatism, stating that he had frequently cured rheumatic paralysis of long-standing in one or two sittings. He always applied, first, a sharp current upon the skin over the affected muscles, by means of dry metallic conductors, then stimulated each paralyzed muscle to contract with the aid of moist conductors. The treatment by galvanism of the following affections were then explained in order: Neuralgia, by means of the continuous galvanic current; constipation, mixed, continuous, and Faradization; chlorosis, amenorrhœa, dysmenorrhœa, mixed; its value in midwifery practice to arrest hemorrhage, to stimulate the uterus to contract, to excite premature labour, or expel a polypus; its uses in chest affections, asthma, aphonia, in indigestion; in affections of the nervous system, paralysis, functional, reflex, and organic; anæsthesia, chorea, delirium tremens; in muscular debility, spinal curvature, knock-knees, and bow-legs; confidently prognosticating that before many years the orthopædic surgeons would set aside the use of the knife and of irons, and depend upon electricity for a cure. Its value in inveterate ulcers and carbuncle, and its probable application in malignant disease, concluding with the method of its administration in drowning, chloroform accidents, and poisoning. Mr. Lobb then described several cases lately treated by him in the London Galvanic Hospital, particularly some cases of dropped hands, the result of poisoning by lead, which he had been the means of rapidly curing, also a very interesting case of torticollis, and a very uncommon instance of complete rheumatic paraplegia, quite cured by the continuous galvanic current in three months. The author hoped that the time was not far distant when every educated practitioner would be as familiar with the application of galvanism in the treatment of disease as he now was with the administration of drugs; each aided the other, and their judicious combination was now producing results hitherto undreamt of; numerous cases formerly abandoned as incurable were now amenable to treatment, and advanc-

ing science was continually adding to their number. Mr. Lobb concluded a very interesting and suggestive paper by requesting the members to investigate the subject, and experiment upon the value of galvanism as a therapeutic agent, promising ample reward for labour.—*Med. Times and Gaz.*, May 9, 1863.

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10. *Ready-made Plasters.*—Dr. Tilt drew the attention of the Obstetrical Society of London (March 4, 1863) to the fact that when one hundred or a hundred and fifty grains of common starch are boiled in an ounce of glycerine, the result is a very stiff glutinous compound, which has no smell, and does not become rancid; and although sticking firmly to the skin, it can be removed and reapplied. Instead of ordering belladonna plaster, Dr. Tilt prescribes three grains of sulphate of atropia to be rubbed down with a few drops of glycerine, then incorporated with an ounce of hard glycerine ointment, and thickly spread by the patient on gutta-percha cloth, or impermeable wash cloth. This can be removed for the morning ablutions, and reapplied after spreading a little more ointment on the same plaster. Morphia and other alkaloids are prescribed in the same way.—*Med. Times and Gaz.*, April 18th, 1863.

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11. *Ointment for Bed Sores.*—The following ointment is said to be an efficacious application to bed sores. R.—Armenian bole, prepared litharge, of each, ʒss; camphor, gr. v; yellow wax, ʒij; lard, ʒvj.—M. To be spread on thick linen.

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

12. *Spontaneous Origin of Eruptive Fevers.*—M. Roger communicated to the Paris Hospital Society the fact that a somewhat severe epidemic of scarlatina and measles had prevailed for some time past at the Children's Hospital. In a case of scarlatina, proving fatal on the third day, two series of lesions, both remarkable for their intensity, were observed. The first of these was a considerable *psorenteritis*, in which the follicles of the small intestine presented a development such as is rarely seen in typhoid fever, but unaccompanied by ulceration. The other lesion was a most intense, violaceous congestion of all the viscera, brain, spleen, kidneys, etc.—the testicles themselves and the tunica albuginea presenting a turgescent lividity. But the highest degree of congestion was found in the lungs, which were gorged with blood, of a violet red, and of a soft consistence. The pulmonary vessels were filled with black, semi-coagulated blood. At the inferior lobe of the right lung there was a vast apoplectic extravasation. In this case the condition of the lung would prove a cause of rapid death independently of the scarlatina poison.

M. Chauffard was of opinion that, with respect to the eruptive fevers, there is too great a disposition to refer them to contagion or infection. The rapid appearance and vast extension of these epidemics would seem rather to point to a kind of spontaneous production, the causes of which are at present not understood. M. Roger was much disposed to agree in this opinion; for in private practice, in which the progress of these cases can be better followed, it is not always possible to refer them to a contagious origin; and, in the midst of epidemics, unable to follow the traces of a contagion, we are often obliged to at least admit the appearance of a spontaneous eclosion. Quite lately M. Roger has met with two cases of measles followed by pertussis; this secondary affection being only explicable by its importation during the short visit of the medical attendant, or by its spontaneous origin, for the children had been most carefully isolated. M. Behier, in corroboration, observed that towards the spring and autumn he has every year observed epidemics of eruptive fevers break out in the different schools in Paris, situated at such remote distances from each other as to exclude all idea of contagion. He took this opportunity of mentioning a remarkable case. He had attended three children of a family for the measles, and was

called five or six years later to see one of these children who had a well-marked second attack of measles. The parents were congratulating themselves at the absence of the other two, at boarding-school, when at the very time of the visit one of these latter was sent home, also suffering from measles. How rapidly contagion is sometimes communicated he illustrated by another case. A mother, entering the Tuileries with her child, on hearing an infant near her suffering under a paroxysm of pertussis, at once withdrew. Nevertheless, at the end of some days her child was seized with pertussis. M. Empis considered the admission of the spontaneous development of the eruptive fevers to be a mere gratuitous hypothesis, which may have a mischievous effect by diminishing circumspection in regard to preservative measures. The true mode of propagation of these affectfons is by infection, to which in populous localities there is constant exposure. M. Roger explained that no one would think of contesting the contagion of the eruptive fevers. All that is now advanced is that we may admit a kind of spontaneous development when contagion has not been in operation. M. Chauffard observed that, while it cannot be doubted that certain diseases were originally imported from distant regions, yet, once brought here, may they not become in some sort naturalized, and be liable to spontaneous development? In 1855 there had been numerous cases of cholera in Paris without any such appearing in the provinces, when, on June 7, the same day on which the first case was observed at Avignon, the disease appeared at several distant points. Here spontaneous production is a more natural explanation than infection; and do we not see the same thing occurring daily with respect to variola, rubeola, and scarlatina? M. Simonet replied that a geographical progress has always been attributed to cholera. Its propagation may thus be traced, and its spontaneous origin here cannot be admitted. As to the eruptive fevers, children are constantly taken to the promenades, and how are we to ascertain when and how they have contracted the contagion? M. Guérard remarked that we have constantly the opportunity of observing that the most infectious diseases may affect isolated individuals, without any epidemic or endemic extension. These are sporadic cases, which in some manner preserve the germ of the disease, special influences, the nature of which we are ignorant, being requisite to give to this germ the generalization of an epidemic. These great epidemic manifestations, such as the variola of 1825, are generally somewhat sudden in their origin, rapid in their progress, and, in this sense, of spontaneous origin.—*Med. Times and Gaz.*, April 25, 1863, from *l'Union Médicale*, No. 48.

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13. *Contribution to the Therapeutics of Continued Fever.*—Dr. THOMAS K. CHAMBERS presented to the Royal Medical and Chirurgical Society (April 28th, 1863), an *analysis of* 214 *cases of fever:*—

108 treated on "general principles."

106 treated on a uniform plan of continuous nutriment and hydrochloric acid.

The first series occurred during the six years ending September, 1857; the second series during the five and a half years ending March 31st, 1863.

Reasons for the cases being fairly comparable.—1. They are each a consecutive series. 2. They are spread over a considerable period of years. 3. All treated by the same physician, and under similar circumstances. 4. Diagnosed and recorded by independent registrars. 5. The equality of the cases is shown by the equality of the mean duration of their convalescence.

Of the first series—
of 13 entered as typhus, 3 died;
of 39 entered as typhoid, 16 died;
of 56 of doubtful type, 3 died.
Of 108, total of continued fever, 22 died.

Of the second series—
of 19 entered as typhus, none died;
of 48 entered as typhoid, 2 died;
of 39 of doubtful type, 2 died.
Of 106, total of continued fever, 4 died.

Excluding from the first series 2, and from the second 1, who died within two days of admission, and gave therefore little scope for judging of the effects of

treatment, there remains somewhat less than 1 in 5 as the death-rate under the first treatment, and less than 1 in 35 as the death-rate under the second treatment. Therefore the second method of treatment is a powerful means of preserving life.

Details of treatment were given, and some remarks made on the action of emetics.

Dr. Weber said that, fifteen years ago, when he was a student at Bonn, the usual treatment of fever was by hydrochloric acid alone, without food. Fifteen drops of the diluted acid were given four, five, or six times a day. The mortality was about sixteen or twenty per cent., the cases being typhoid. The fever was, on the whole, more violent than here. Dr. Weber thought it would have been better to have made a comparison between the treatment by hydrochloric acid and no treatment.

Dr. Murchison had listened with much interest to Dr. Chambers' communication, inasmuch as the treatment recommended closely resembled what he had followed at the Fever Hospital during the last eighteen months. The treatment of typhus and allied fevers by the mineral acids was a very old one; it had long been the favourite treatment in many parts of Europe, particularly in Germany and Sweden. At the same time, he had not that implicit faith in it which Dr. Chambers appeared to have, and he must protest against Dr. Chambers' inference, that his treatment was calculated to prevent fifteen out of every eighteen deaths from fever. Dr. Murchison had employed the mineral acids, in conjunction with abundance of fluid nutriment, and wine when indicated, in upwards of 1500 cases of fever, and although he had often seen the most marked improvement (cleaning of the tongue, &c.), follow the use of the acids, his statistical results had been much less favourable than those now announced to the Society. He was convinced that, with more extended experience, Dr. Chambers would be compelled to modify his opinion. Dr. Chambers' statistics were open to several fallacies. 1. The cases selected for comparing the results of different plans of treatment had occurred at different periods, instead of at the same time. 2. In both series the form of fever had not been determined in a large proportion of the cases, and no details had been given to enable any one to judge of their severity. Many of the cases "of doubtful type" had probably been examples of simple fever, which was rarely fatal under any method of treatment. The results would be materially affected by the proportion of cases of simple fever or febricula in either series. 3. The rate of mortality in the first series, treated "on general principles," was far above the average mortality from fever in general hospitals, and hence it was not a fair standard of comparison. The total mortality in this series (including febricula) had been twenty per cent., for typhus alone twenty-three per cent., and for enteric fever no less than forty-one per cent. 4. The ages of the patients suffering from the different forms of fever had not been given. Age exercised little or no influence over the rate of mortality of enteric fever; but in the case of typhus, the results of different methods of treatment could never be satisfactorily compared without taking the ages of the patients into consideration. Under twenty years of age typhus was rarely fatal; above fifty, the mortality was nearly sixty per cent. 5. The number of cases was too small to warrant any decided opinion as to the advantages of the treatment recommended. The second series included only nineteen cases of typhus and forty-eight of enteric fever, diagnosed as such. A practitioner, with extensive experience in fever, might often have under his care twenty cases of typhus in succession, without losing a single case, but then if he lost five cases, the mortality would be twenty per cent. During last autumn, of forty-one successive cases of enteric fever, under Dr. Murchison's care, only two died, one from perforation of the bowel, and the other from acute tuberculosis—lesions not likely to have been cured by any treatment—yet the rate of mortality for the entire year had been considerably greater. Most of the forty-one cases had been severe, but in none had a drop of hydrochloric acid been administered. Dr. Murchison doubted if the hydrochloric acid possessed advantages over the other mineral acids. Although he believed that the treatment of continued fevers by the mineral acids, together with a uniform system of nourishment, was justified by our knowledge

of the pathology of fever, as well as by experience, he was confident that Dr. Chambers' statements were calculated to make those who heard them too sanguine as to the results to be obtained from it.

Dr. Chambers, in reply, said that all statistics were open to the objections raised by Dr. Murchison—that they were not long enough. His statistics were not brought forward as conclusive, but as a help to further inquiry; and he would grant that it might be found that the mortality was slightly different if further series of cases were compared, but not so as to affect the practical conclusion. His reason for bringing forward the two series of cases, the subjects of the paper, was, that being equal in number, and being pretty much under the same circumstances, they were fairly comparable. The difference in the mortality might be due, it was said, simply to a general difference in the mortality of the fever, at the two quinquennial periods; but he had found that the mortality from fever in the two periods was as nearly as possible equal, taking Dr. Murchison's statistics as his authority. He did not bring forward the cases to exemplify the acid treatment, but rather as evidence of the value of continuous nutriment. In fact, he believed that the acid was beneficial principally in a subsidiary manner—in preparing the digestive mucous surface for the nutriment. That it did thus produce a beneficial change was evident from the clearing of the tongue. In reply to Dr. Waters, the author said that wine was given in both classes, but only in cases in which it was strongly required, on account of the expense. The treatment in Germany by acids was not successful from being relied on solely, and not supplemented by nutriment.—*Lancet*, May 16, 1863.

14. *Fevers of the South-east Coast of Africa.* By Chas. J. MELLER, medical officer of Dr. Livingstone's exploring party.—Although the time spent in the Rovuma, Zambesi, and Shiré rivers, has been too short to enable one to form statistics, or tabulate results of practice, I am able, from the number of cases we have had, to select the more salient points of the fever common to all the rivers; and to point out the principles of treatment in the typical form and varieties. To know the fever in its different forms, it would be necessary to study it in the reputedly healthy and unhealthy parts of the river, at different times of the year. This we have not been able to do.

We were only in the Rovuma a short time—March, and part of February, 1861—and left it, from finding it rapidly falling. Probably, we entered it just at the end of the rainy season. Before leaving it we lay by a mangrove swamp, for five days, procuring wood. A few cases of simple fever had occurred, attributable rather, I think, to exposure to the sun in boats than to malaria; but whilst we were lying by these mangroves, a more severe form rapidly spread amongst us. The patients were first attacked with griping and vomiting; followed by headache, hot skin, and the usual symptoms of the second stage; or by exhaustion to syncope, long continued rigors, or profuse sweating, without cold or hot stage. The system seemed to have suddenly received a poison of such sedative power that partial collapse ensued, reaction from which was, in two or three cases, procured only after stimulants had been frequently administered. Griping being an unusual concomitant, we looked for some cause to account for it; and thought we had found it, on observing that the water flowing by the ship, and which we had been drinking, came from a creek in the mangroves, and was exceedingly impure from the amount of vegetable matter floating on, and held in suspension in it. Within the five days, but four out of the whole number of white men on board (twenty) escaped. To avoid further infection and bad consequences, we left the river as quickly as possible, carrying, however, so much fever with us that all the sailors but one remained in the sick-list incompetent for duty for nearly a fortnight afterwards; and there were but two or three who had returned to duty when we reached Johanna on the 8th of April. An incubatory process must have existed after leaving the river; for several who were not affected severely while in it, were great sufferers at Johanna, and on the way to the Zambesi, which we reached on May 1st, having left Johanna April 22d.

The following three months, which are reputedly the healthiest, were spent in the Zambesi and Shiré; and the mild character of the fever we had would

seem to confirm this opinion. For the sake of studying the fever, the year may be divided into three seasons, wet, hot, and cold. We entered the Zambesi at the commencement of the last, which old residents have considered the healthiest with respect to fever, though in its place we have skin-diseases and congestive disorders prevalent. It embraces the months of May, June, and July; then succeed two months when diarrhœa and dysentery occur, and fever is more severe. The rains begin in September or October; and when they are well set in fever almost disappears, unless it be brought on through undue exposure to wet and damp, or sleeping in wet clothes. The rainy season may end in January or February, earlier or later, according to the time of setting in; but these months include the range. The two months that precede and follow this season are the unhealthiest. Fever is most virulent in those that follow, when the marshes and lagoons are drying up, and miasmata from decomposing vegetable matter are evolved. During the wet months, in place of fever, we have affections common to moist atmosphere in all countries, boils, prickly heat, catarrhs, etc.; and some special to the river—œdema of the feet, and a peculiar eruption resembling herpes zoster.

It first appears in the axilla and inguinal regions as slight elevations of the cuticle, with a zone of pink erythematous blush. There is great itching; on the second day a vesicle forms; on the fourth or fifth this becomes a pustule with thin milky pus, which has a peculiar odour. Desquamation occurs on the seventh day, leaving behind semilunar or oval patches of the surface, slightly elevated; or, after the first appearance of vesicles, the subcutaneous tissue becomes infiltrated, and of a condition that, at first sight, resembles that of phlegmonous erysipelas. The vesicles coalesce; the part becomes much swollen and very tense; there is no throbbing nor pain; and itching is constant and very troublesome. Or a few pustules may form on the chest and neck; and red swellings appear in different parts of the body, generally over the elbows and patellæ. The health suffers just before the eruption; and whilst it continues, the appetite fails, the tongue is coated white, leaving marks of teeth-pressure; sometimes there is diarrhœa. If the eruption continue long, an anæmic look follows; œdema of the feet, if present at the commencement, becomes worse. The treatment has included alkalies, alteratives, and tonics; saturnine lotions to erythematous patches; and warm clothing. The œdema is always confined to the feet and legs. There is nothing in the state of the urine to account for this condition; nor, in fact, would the attention be drawn to the swelling were it not from the difficulty that is soon experienced in putting on boots. Dysentery in a mild form has occurred in the hot and wet months; it has yielded to alteratives, ipecacuanha, and careful diet. Diarrhœa is common at all times; most so in the cold months. This may be from the great alternations of temperature that occur during the night—a difference of as much as 35° being frequently registered between 12 and 6 o'clock A.M.

The fever of the Zambesi, as found by Dr. Livingstone in 1858, was described as of the sthenic intermittent kind. That, however, of the last year has rarely assumed this character, being generally of the asthenic remittent type; when intermittent, being only so for a short time, and always resolving into remittent. As it was first observed in 1858, the paroxysm was sudden; there were few premonitory indications; the patient had chills and rigors, with headache, pain in the temples, and aching of the loins. In the hot stage, there was complete stoppage of secretions; the headache became more and more severe; occasionally there was delirium. The tongue did not always change with the progress of symptoms: it might remain healthy-looking through this stage. It was when these symptoms are established that the Livingstone specific must be given, if the first stage had been allowed to pass without its administration. The composition of this powder is the following: Rhubarb, gr. x; resinous extract of jalap, gr. viij; calomel, gr. iv; quinine, gr. iv. This quantity used to be given in five pills, with the view to relieve the *primæ viæ* quickly. Quinine was given about an hour after the pills, and continued every two or three hours, in five or ten grain doses, to cinchonism. The greater the deafness produced, the greater was the assurance of speedy restoration.

Generally the force of the attack was spent by the full action of the pills;

and it was not uncommon for the patient to resume his occupation on the third day after that of the attack. The exceptional cases were those in which the fever had been brought on by exposure to wet or sun, and the treatment had been delayed; or in which obstinate vomiting was present. Quinine was continued in five-grain doses until perfect restoration was secured, when the ordinary three-grain dose, taken with coffee early in the morning, was resumed. The attacks were sharp, but short, quickly gave way to treatment, and left the patient apparently none the worse.

In the past year, however, the fever has taken a less active form; the symptoms have been less decided; the stages ill defined, or none; and treatment less efficacious. So irregular have the symptoms been, that the sthenic class is now the least often found; very rarely is the intermittent form met, and, when purely so at the onset, it soon becomes remittent. The symptoms may be classed, according to their regularity and force, under three heads: 1. Those of the sthenic form of fever, in which they are most highly developed and defined; 2. Those of the asthenic form, where no order is followed—a prolonged cold or hot stage, or absence of one stage altogether, ending in great exhaustion, relieved only when full perspiration is procured; 3. The ephemeral—a mild form of the sthenic, in natural sequence, and lasting but a short time without any complication. The sthenic form is that generally met with in first attacks, and answers to that described by Dr. Livingstone in his letter to Sir James Clark in 1859; but the treatment has not been so successful in producing rapid cures. The purgative "specific" has had to be repeated frequently before relief came; and when this has been necessary, and time been lost, the cure has been by so much delayed; so that, in place of three days, we must say seven, as the average time of each patient on the sick-list. Headache has always been the last symptom to leave; and, so long as it has lasted, large doses of quinine have been continued.

But when the patient has had frequent attacks, the stages become less marked, and the symptoms less amenable to treatment. The premonitory symptoms are ill defined. The fever may be ushered in by the patient feeling chilly, or as though currents of cold air were passing over the spine; or there may be a distinct rigor. This state may be continued for twenty-four hours, or alternate for that or a longer time with headache and heat of skin. There may be no cold stage at all, or no hot stage; or the paroxysm may consist only of alternations of the two; the headache, pains in the loins, and languor, meanwhile increasing. There may be vomiting from the outset; when this occurs, the case is always tedious. Or the cold stage may be so prolonged, that reaction is with difficulty induced. The tongue may be foul, or clean throughout; but relief will not be afforded until the secretions are restored healthily, and free perspiration procured. The symptoms may be so few and undeveloped that they are scarcely noticeable; a man who has had fever frequently will only be able to appreciate them for what they prognosticate. If left alone, they recur again and again, gradually prostrating the patient, and ultimately merging into the remittent form when they have almost exhausted the strength of the victim. It is in the insidious progress of these symptoms that the opportunity is lost of treating actively. The first symptoms may be merely giddiness, and a feeling of languor, not calling for more than a stimulant. If they recur, the same remedy is used with quinine. But, though relieved, the patients are not cured; they become jaundiced gradually, and sickly-looking; and now the tongue for the first time may become foul, though, unless there be other evidence of hepatic derangement, it is as often clean and pale throughout. And now, when the system has already become debilitated, the difficulty arises in the treatment, as the means taken to relieve the liver, whether mild or active, cannot be depended upon to relieve the system thoroughly, as in the sthenic type of the disease. The liver may be relieved; but generally relief is not obtained, and the prostration becomes greater the oftener this form of medicine is administered. It is generally in this condition that vomiting sets in, frustrating every attempt to push in sustenance or medicine.

The oftener a patient suffers in this way, the more spurious and irregular is the process of the fever. The intervals of attacks never permit him to resume

work long; headache and giddiness, loss of appetite and sleep, keep him constantly ailing. He seems to be only cured so long as he is under the full influence of quinine. Large doses have been given to patients suffering in this way—ten or twenty grains every day, so long as the slightest indication of the approach of an attack existed, or the symptoms from the last one had not entirely disappeared. But, though lessening the severity, they have never warded off an attack, nor lengthened the intervals between the paroxysms.

It is not unfrequent that after sthenic fever, a patient may, after regaining health, suddenly lose appetite and sleep, and have pricking sensations through the skin, with constipation or diarrhœa. These, if allowed to take their course, or if only treated individually, resolve into periodical returns, and, progressing in development, assume the remittent form. In treating each symptom as it arises (when pointing to functional disorder in any organ) specifically, antiperiodic doses of quinine are given; and, should this combination of treatment prove ineffectual, it has been found best to treat for the removal of vitiated secretion, and restoration of healthy action in the liver and any other organ affected; following with quinine to cinchonism, and continuing its use in large doses almost to cinchonism until every symptom shall have disappeared. As a rule, this treatment is sufficient; but, when a patient falls into this form of fever, he is in a low condition of health, pale, and dyspeptic. Vomiting may set in at any time, and, if it be long continued, will delay the cure; for until the remedies can be retained, and the secretions restored in healthy form, no permanent relief can be expected. Generally, when vomiting is severe, there is jaundice, sometimes with pain over the hepatic region. So soon as medicines can be retained, a large dose of calomel and jalap is given. In addition to large bilious evacuations by stool, the urine is frequently found deeply tinged by bile.

The same complications may occur in the process of the sthenic form. The liver, though relieved at first, may suffer blockade a second time; jaundice may be universal in a few hours, with tenderness over the liver; or there may be complete arrest of the secretion: and, when this amounts to suppression, the circulation becomes clogged; the heart's action is troubled, and frequently a mitral *bruit* is heard; and there is a feeling of weight at the præcordia. As the functions of the liver and emunctories are restored, the heart's action becomes more natural; but *bruits* have remained until the strength and flesh have been made good. In two cases, an anæmic condition remained after treatment had reproduced healthy action of the liver and kidneys. If a loud *bruit de diable* was heard along the course of each jugular, as well as a loud mitral murmur, both gradually disappeared as health and strength returned.

In the asthenic variety, a murmur has commenced with the earliest symptoms, and has progressed and faded away with them. Indistinct at first at the heart's apex, it has grown more defined, being accompanied when loudest with a *bruit* along the jugulars; and it has died away as it commenced. But, in its progress, the heart's action is troubled; the patient feels oppression and distress in the region of the heart; he cannot sleep from the continuance of these sensations, and finds it difficult to lie on either side with comfort when there is *bruit de diable* along both jugulars. The cause of this may be found in the anæmic state into which patients rapidly fall after long continued spurious fever, or after long continued sthenic, in which the treatment has been active, and heroic doses (twenty grains of the specific, repeated three or four times in the course of twenty-four hours) have been used. Corroborative of this view, we find frequently œdema of the lower extremities, without any indication of renal disorder, blanched skin, small weak pulse, and tendency to syncope.

After many attacks, the spleen frequently suffers. Attention is first directed to it by pain and tension beneath the ribs, simulating, from its suddenness and acuteness, pleuritic affection. Percussion and auscultation will soon define the limits of the enlargement, as the spleen presses forward immediately against the cartilages of the lowest ribs, and the anterior edge forms a distinct prominence.

As sequelæ, may be mentioned intractable diarrhœa; headache, general, or hemicranial, or over the brow; vertigo; and, in the asthenic, œdema of the legs.

Ulcers form from the smallest abrasion, and will not heal until the general tone be improved.

There is a modification of the symptoms of this fever: it is simply the mildest form of all the stages in natural sequence. It does not require the active treatment of the sthenic, but it must be at once combated with the usual means in smaller doses; and quinine must be continued to cinchonism. If neglected, it will recur as intermittent; soon, however, becoming remittent. Those who have been longest resident in the country have these slight attacks. The strength is very slightly affected by them. The treatment is based on the principle that the *primæ viæ* must be relieved and healthy secretion restored before any permanent good can be effected. With this view, the composition of jalap, calomel, and rhubarb, is given at the outset, and repeated again and again, until the secretions are fully relieved, and restored to healthy characters. In obstinate cases, other drastic purgatives are combined, until thorough purgation has been effected. Recovery is tedious and protracted in proportion as this object is quickly or tardily achieved.

But in asthenic cases, where the stages are irregular, and where there is often difficulty in inducing reaction after a fitful, long continued cold stage, the purgative is given in smaller doses with a stimulant; and (if there be no vomiting) reliance is placed in producing as quickly as possible the full influence of quinine.

Complications of vomiting, headache, pains in the renal region, loss of rest with extreme restlessness, are treated by ordinary means. A full dose of morphia given after purgation, often relieves all these symptoms and induces sleep, from which the patient awakes almost restored to health.

As to the virtue of quinine as a prophylactic, I can, from watching its influence on our small party, give only negative conclusions.

1. It cannot be depended upon, in any dose to avert an attack; though it would seem that, if given in a large dose on the first approach of symptoms, it will lessen the severity of the paroxysm. We have given every morning for a year past a dose of three grains with a little wine or rum; the rum because early morning is a very cold time during the greater part of the year, and cold and misty during May, June, and July, and the men seem to require a stimulus at this more than any other time. But, though this practice has been religiously persevered in, fever has not been warded off; in fact, it has been less frequent with some of those who have been longest in the country, and who refused to take the quinine regularly, than with the latter arrivals, who have never missed taking the morning dose.

2. In addition to the morning dose, large additional ones have been given to men who have been frequently attacked, when they have felt indications of an approaching attack—ten, twenty, or thirty grains at a dose; but the paroxysm, though mitigated (as compared with that when no quinine has been given) in severity, has never been warded off.

3. Some of the expeditionary party have almost entirely abstained from taking quinine for a year or so past. These men have not been more liable to fever; and, when attacked, have not suffered from any more severe form than the rest. These men, however, have never refused quinine during fever, knowing that they cannot hope for safety until they shall have been cinchonized.

4. During the two months when the boats of H.M.S. *Gorgon* were up the river (which must be considered an unhealthy period, as the rains had ceased earlier than usual, and marshes were drying up), there were 12 men left at the mouth of the river, who took no quinine nor fever; whilst of the 54 men who went up in the boats, and who were regularly taking it with a double ration of spirits, 6 only had escaped fever on their return to the sea, and of these six men one alone had escaped a month later. Of the complement carried by the *Pioneer* (22) but two escaped. Those, however, who were left at the mouth of the river had the advantage of sea-breeze (which set in for the greater part of the day) during the whole time the rest were absent. Of 39 *Gorgon* men, who went seventy-four miles up the river and returned after thirty-two days, 34 had fever. Of 15, who were sixty-one days up river 14 suffered. These men, for the greater part of the time, had ordinary ship's rations, with extra rum, given

with a daily dose of quinine. It was observed that those men who were young and active were more immune than the older, more feeble, or indolent.

5. It might be thought that three grains for an habitual dose were too small to test the efficacy of the remedy, and that no satisfactory result could be obtained from it. But very large doses have been given, as before said, with no more satisfactory result; in fact, we have had to invalid one man who had constantly taken these large doses, and from whom the fever was never averted.

There are circumstances that modify fever. Though in the rainy season there is less of the disease than at other times, the form is more severe, because an attack is always brought on by the patient becoming thoroughly wet, or from having slept in damp or wet clothes.

The excessive irritation from mosquito bites will keep up fever, in spite of all treatment. The loss of rest occasioned will unfit one for the day's duties; appetite is lost; and headache sets in. A harsh diet of coarse native grain and foods will often throw the system into disorder, producing headache, dyspepsia, etc., and probably predisposing the body for the reception of malarious poison.

The consideration of these points may indicate the best means for prevention. Care should be taken to insure a dry sleeping-place, and warm dry clothing for night use. A good mosquito curtain should be provided. Each person should on rising take some strong hot coffee. It is essential that a generous mixed diet be had so long as river work continues. The time of year best suited for river exploring or other work is the rainy season; but this only holds good so long as there is thorough protection from the rain. But for open boat work it would be very unadvisable to try this time of year, and much better to take the dry cold months of May, June, and July; for though one travelling in these months would be more subject to diarrhœa and congestive disorders, from the changes of temperature between night and morning, fever attacks would be comparativly mild.

There can be no doubt of the malariousness of these rivers, and that immunity from the diseases specified cannot be guaranteed, however sedulously precautions and sanitary measures be carried out; but from the large number of cases occurring amongst the men who have been resident long enough to test the climate, and be tested, and the small percentage of death—one only having occurred in the *Pioneer* during the last twelve months—there can be no doubt that the fever *per se* is of a mild disposition, perfectly amenable to treatment when taken early, and dangerous only when left to take its own course.—*British Med. Journ.*, Oct. 25, 1862.

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15. *Diseases of the Skin developed in Schools, Workhouses, and Factories, from Defective Hygiene.*—Mr. T. Hunt read before the Epidemiological Society (Feb. 2d, 1863) a paper on this subject. He stated that he wished prominently to bring forward the effect of congregating and incarcerating many children or young persons under one roof, of feeding them on one and the same diet, and thus promoting locally the more or less permanent inroads of certain cutaneous diseases, which diseases often subside spontaneously upon the removal of the sufferer from the locality. These diseases are chiefly the common ringworm (*porrigo sentulata*) and scabies, the former being usually aggravated by the presence of a vegetable, the latter by an animal *parasite*. He had never visited a workhouse, or a detachment of pauper children, or a large boarding-school occupied by the poor, without observing many cases of ringworm and scabies; one of these two diseases prevailing at one time, the other at another period, and both showing a tendency to pustulation. These cutaneous plagues will often persist month after month, in spite of the most careful treatment and the most scrupulous attention to cleanliness and ventilation. He had already published an account of an endemic scabies which infected, for many months together, a large girls' school in the neighbourhood of London, where cleanliness, ventilation, good drainage, good nursing, and good medical care were conspicuously apparent. But nothing was of any permanent service until an entire change of diet was introduced, together with the daily exercise of the inmates away from the premises. Accounts of similar endemic difficulties reached the author from medical practitioners who had the charge of institutions of the

same character in different parts of the country, and the same kind of treatment proved equally effectual in all of them. In those factories where children are employed, and *boarded* and *lodged* on the premises, like occurrences are observed, involving the clean and the dirty, the well-fed and the ill-fed. The doctrine of contagion fails to explain the cause; nor, indeed, is any one imaginable cause to be named that is capable, *per se*, of accounting for all the peculiarities of the case. But it appeared to him, that by duly reflecting upon *all* the sanitary circumstances in which these children are placed, we may be able to discover an aggregate of influences, so to speak, which not separately but concurrently may combine to produce these morbid conditions. Atmospheric impurity, unnatural diet, deficient exercise, and contagion, are the four conditions which appear to unite their several forces to perpetuate these loathsome affections of the skin. And yet not one of these causes alone ever presents a formidable difficulty in the treatment; neither do any of them exist in any prominent degree in these establishments. There is no sensible vitiation of the atmosphere, no bad smell, no defective drainage, no neglect of ventilation. The diet is excellent in quality, plentiful in quantity, wholesome in character, and correct in its chemical elements. Exercise is allowed and encouraged within the walls of the institution, and contagion is for the most part antagonized by care and cleanliness, and often by individual segregation. So that, considered apart, these causes of disease exist, if at all, in scarcely an appreciable degree. And yet, together, they are capable of establishing a most formidable cachexia. They poison the blood, producing not only their immediate effects in the form of parasitic skin disease, but laying the foundation probably of more serious disorders, manifested in after life by the presence of lumbrici, ascarides, tapeworm, pediculi, fungi. hydatids, tubercles, and perhaps cancerous germs, in the various organisms which, under morbid changes, become capable respectively of nourishing these distinctive parasites. The author then considered the causes referred to singly, and of sameness of diet he said: There is a daily dole of potatoes with boiled mutton, or potatoes without boiled mutton; there is the eternal pea-soup or oatmeal gruel, with so many ounces of bread, and so many grains of salt. Oh, what a luxury would a red herring be to those poor creatures, or a lettuce, or an apple, or a dish of greens, or carrots, or turnips. Man was made capable of living upon a *variety* of food, animal and vegetable, fish, flesh, fowl, root, leaf, stem, fruit, and seed. But no man can live on bread alone; no, nor on mutton chops alone, nor on any two or three articles alone. The life supported by half-a-dozen changes only is in a feeble, imperfect, half-poisoned condition. It appeared, then, to the author, that these four causes, atmospheric impurity, sameness of diet, insufficient exercise, and contagion, all of them trifling in degree, are yet capable of working together for evil, and may thus become powerful agents in the promotion and perpetuation of disease. The blood becomes vitiated from the unvarying character of the diet, from impure and stagnant air, from deficient perspiration, and restricted activity of limb, and the agents of contagion triumph over the low degree of vitality which results. If this be sound pathology, these combined evils will probably be found to play a busy part in the production or aggravation of other diseases, endemic or epidemic in their character. Fortified by an ample, generous, and varied diet, free ventilation, active exercise, and cleanly habits, our junior population might set at defiance cholera, diphtheria, dysentery, and typhus, and probably half the physical "ills which flesh is heir to."—*Med. Times and Gaz.*, March 21, 1863.

16. *Diphtherial Nerve Affections.*—E. H. GREENHOW read a paper on this subject before the Royal Medical and Chirurgical Society (March 24th, 1863). He began by stating that the epidemic sore-throat, which, under the name of diphtheria, had latterly engaged so much attention, was well known to be followed by nervous phenomena of a peculiar kind. These consisted chiefly of impaired, excessive, or perverted sensibility, together with more or less complete paralysis of the muscles of the fauces, pharynx, tongue and lips, extremities, trunk, and neck; the frequency of the occurrence of these symptoms in the several sets of muscles being nearly in accordance with the order in which he

had placed them, the first-named being the most frequently and the last the least frequently affected. The author had had the opportunity of watching the course of several cases of these diphtherial nerve affections in patients under treatment at the Middlesex Hospital, and the present paper was in a great degree based on those observations. He did not mean to infer that every attack of diphtheria was followed by some of these secondary nerve affections, for he had seen patients recover perfectly without experiencing any of them; nor to assert that their intensity was always proportioned to the severity of the primary disease, for he had sometimes seen them follow comparatively mild attacks of diphtheria. Nevertheless, as a general rule, he had certainly observed these nerve affections to be more frequent after the worst cases of diphtheria, and to bear some proportion even to the local severity of the attack; he had noticed, for instance, that the paralysis and anæsthesia were sometimes more complete on that side of the fauces which had been most severely affected by the primary disease. The author had found that a brief period of convalescence—generally not exceeding a few days, but in rare cases extending to weeks—almost always intervened between the disappearance of the sore-throat and the accession of the nerve symptoms; and cases had fallen under his notice in private practice in which patients who had recovered sufficiently from diphtheria to be sent from home for change of air, had subsequently fallen into a helpless condition from diphtherial paralysis. The fact of this interval seemed to him important, inasmuch as it went far to show that the paralysis could not be entirely attributable either to the albuminuria which so often accompanies the acute stage of diphtheria, or to the anæmia which closely follows it, as patients had often got rid of the former symptom, and had even begun in some cases to regain flesh and strength, before the accession of the paralytic symptoms. The author had observed that these nerve affections do not at once attain their maximum of intensity, but are progressive even in the same sets of muscles; and also that if several of the sets of muscles which he had enumerated should be attacked in the same individual, they do not become affected all at once, but in succession —the faucial or pharyngeal muscles being the first to suffer, and so on in the order in which he had placed them at the beginning of the paper—though it by no means followed that all of them should be affected in any one case. He had found the muscles of the fauces by far the most frequent, as well as the earliest, seat of nerve affections after diphtheria, and had seen them attacked in many cases in which the rest of the muscular system either entirely escaped or was very slightly affected. When the fauces were paralyzed, the soft palate lost its natural action, the speech often became imperfect, and liquids regurgitated through the nostrils. These symptoms should be discriminated from the hoarseness of voice and return of fluids through the nostrils which often occur during the acute stage of diphtheria, and arise, as in ordinary quinsy, from the swollen and painful state of the fauces impeding the natural action of the parts. Anæsthesia had co-existed with the paralytic affection of the fauces in all the cases that had come under the author's notice, so that these naturally very sensitive organs became altogether callous and insensible to touch. Next to the affection of the fauces, impairment of vision, probably due to paralysis of the ciliary muscle, appeared to be the most frequent of the nervous disorders consequent on diphtheria. The author had observed that the pupil of the eye became dilated, and acted sluggishly under the influence of light a day or two before the sight became sensibly impaired, and often remained so for a time after the sight had been regained; also that patients unable to read with unassisted sight could do so with the help of convex spectacles; and hence he attributed the impairment of sight to a temporary loss of adjusting power. The nerve symptoms which he had noted in the tongue and lips were, formication, or a sense of scalding, numbness, and impaired taste and power of movement. They began, for the most part, in the lips and the tip of the tongue, and gradually extended upwards towards the dorsum and root of the latter organ. The limbs had suffered more or less, in all the five cases which formed the basis of the paper, from paralysis and anæsthesia, besides tenderness and abnormal sensations, such as coldness, formication, and a feeling of constriction in the fleshy parts, as if they were tightly bandaged. These affections began either first in the upper,

or at the same time in both the upper and lower extremities, and were at their commencement peripheral, extending gradually upwards from the tips of the fingers and toes towards the trunk and in some cases affecting the lower part of the back and of the abdomen. He had found that pressure over the sciatic and median nerves was sometimes attended by acute pain, and that pressure of the instep between the finger and thumb sometimes caused convulsive starting of the leg and foot, as well as pain. He had observed that the paralysis in some cases assumed a more or less hemiplegic character, but had seen no instance in which, one side being paralzyed, the other remained entirely unaffected. The author had seen nerve-affections after diphtheria of a graver character than any of those exemplified in the present group of cases, and several even fatal cases had fallen under his notice in private practice. In three of these latter, death was caused by failure of the action of the heart, and in one by exhaustion from vomiting. He believed, however, that such cases were fortunately exceptional, and that the great majority of sufferers from diphtherial nerve-affections, under good management, sooner or later recovered their usual health and strength. The author had satisfied himself that these cases were best managed on sound general principles. Generous diet, and a liberal allowance of stimulants, together with rest in bed, he believed to be always necessary. Tonics, especially steel and quinine, or the mineral acids, he had found useful from the first appearance of the nerve-affections; and after the complete development of the paralytic symptoms, nux vomica and strychnia had proved in his hands most valuable remedies. Subjoined were the five cases on which most of the remarks in the paper were founded.—*Med. Times and Gaz.*, April 4.

17. *Suppurative Aortitis: its Influence in producing Purulent Infection.*—M. LEUDET, of Rouen, has published a paper on this subject, which, though the observed facts are as yet few, is of some importance. In 1829, M. Andral, in his *Précis d'Anatomie Pathologique*, described an abscess existing in the coats of the aorta. The correctness of his interpretation of what he saw was, however, long doubted; and Rokitansky suggested that a softened atheromatous deposit had been mistaken for an abscess. On the other hand, Virchow, in 1847, stated that he had been on the point of supposing an abscess to be a softened atheroma, until microscopic examination revealed the presence of distinct pus-corpuscles. In 1852, Spengler published the first case in which the clinical history had been ascertained. The patient, after exposure to cold, had subacute articular rheumatism; then, after being again exposed to cold, he had general symptoms of thoracic and cardiac inflammation, followed by symptoms of purulent infection. At the post-mortem examination, there was found to be ulcerative endocarditis, with an abscess between the coats of the aorta opening into the heart. In 1856, Dr. Schutzenberger communicated to the Strasburg Medical Society the history of a man who was recovering from pneumonia of the left lung, when he was attacked with violent rigors occurring at irregular intervals, copious sweating, and a peculiar yellow tint of the skin and sclerotic. At the autopsy, an abscess of the size of a nut was found, which had formed between the external and middle coats of the aorta, and opened into that vessel. M. Leudet has also observed a case similar to those related by Spengler and Schutzenberger. In all three, abscess was at the origin of the aorta; but this is not always its seat, for M. Leudet refers to two cases noticed by Rokitansky and Lebert, where the collection of pus was higher up in the vessel. Suppuration may also, in place of being idiopathic and primitive, be a consecutive result of the deposition of atheroma. In the cases collected by M. Leudet, the pus was collected in a small cavity in the external cellular coat, and was infiltrated into the middle elastic coat. These two coats, especially the external, presented marked vascular injection. Fine capillary vessels sometimes extended into the thickness of the middle coat, but never reached the inner coat, which most generally was not at all coloured. In no case were false membranes or clots observed at the level of the inflamed artery. The pus presented the ordinary characters of this secretion. The large opening by which the abscess communicated with the vascular canal had no doubt introduced a small quantity of pus into the blood during life. The existence of pyæmia was denoted by the simultaneous presence of

abscesses in the liver, lungs, spleen, etc. In M. Leudet's patient, there was meningitis; in Rokitansky's case, abscess of the spleen; and Spengler's patient had hypostatic pneumonia. The study of the symptoms of suppurative aortitis is rendered very difficult by the coincidence of numerous lesions, which may mask the peculiar symptoms of the disease. The first stage of the disease is one of inflammation, probably simply exudative, of the coats of the vessels or of the heart. This inflammation is generally intense, as appears from the results of post-mortem examinations. It is that form of endocarditis which M. Bouillaud terms phlegmonous, in opposition to superficial; he compares the first to phlegmonous, and the second to simple erysipelas. Nothing in the symptoms of the cases appears to have led to the suspicion of so intense an inflammation. After the manifestation of symptoms which may be supposed to denote the presence of exudative inflammation, there is a kind of remission, which is, however, far from constituting complete convalescene. These symptoms of purulent infection set in—especially rigors. This symptom may lead to a diagnosis, when no inflammation can be discerned elsewhere, especially in the venous system.—*British Med. Journ.*, Feb. 7, 1863, from *Arch. Gén. de Méd.*, and *Gaz. Méd. de Paris*, Dec. 20, 1862.

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18. *A Contribution to the Pathology of the Crura Cerebri.*—Dr. Hermann Weber related to the Royal Medical and Chirurgical Society (April 28, 1863) the following case:—

"A man, aged fifty-two, affected with disease of the aortic valves, hypertrophy of the left ventricle, and rigidity of the larger arteries, had, during the last years of life, frequent tinnitus aurium, a dull but moderate headache, disturbed sleep, and anxious dreams. Two months before death, there occurred sudden paralysis of the *right side of the body* (limbs, trunk, and face) as to motion and sensation, and of the muscles of the *left eye* supplied by the third nerve, with dilatation of the *left* pupil; disturbance of vision only slight—viz., imperfect double vision when using both eyes combined, and impaired accommodation when using the *left* eye alone; the other special senses and the intellectual faculties unaffected; slow and irregular pulse; obstinate constipation; increased temperature in the paralyzed limbs. The paralysis of the right side of the face, the soft palate, the tongue, and the trunk, had been from the beginning less complete, and became gradually much diminished, as well with regard to motion as to sensation; that of the limbs, on the contrary, remained almost complete with respect to motion, while the sensation gradually improved. The paralyzed muscles of the left eye regained their function only very imperfectly; and the left pupil, too, remained much dilated. The obstinate constipation continued. About eight days before death, symptoms of broncho-pneumonia and pleuritis, especially of the right side, came on. Death took place two months after the seizure.

"*Post-mortem examination.*—Phenomena of recent broncho-pneumonia and pleuritis occupying the greater portion of the right lung, and existing only in a very limited manner in the lower lobe of the left lung. Hypertrophy of the left ventricle of the heart, with disease of the aortic valves (rigidity through atheromatous deposit, stenosis of the orifice, and insufficient closure). Extensive atheromatous affection of the arterial system, and especially of the cerebral arteries. Hemorrhage into the inferior and internal portion of the left crus cerebri, the cavity being about six-tenths of an inch long, and five-twentieths of an inch broad, and as deep; it was situated close to the surface, and in immediate contact with the third nerve, the nerve-fibres of which were degenerated. The tissue of the crus round the cavity was hardened in the thickness of about one-fifteenth of an inch. The remainder of the left crus and the other portions of the brain were normal.

"Dr. Weber remarked that the diagnosis in this case had been comparatively easy. The sudden paralysis of the right side of the body, with paralysis of the third nerve of the left side, and with immunity of the mental faculties and special senses, pointed unmistakably to an affection near the base of the left hemisphere, and in immediate connection with the third nerve, therefore also the crus cerebri. The fact that none of the other cranial nerves were affected indicated that the

morbid condition was confined to a small spot, and the existence of the disease of the arterial system recognized during life rendered hemorrhage more probable than any other alteration. Dr. Weber thought under similar circumstances an almost accurate diagnosis might be always ventured.

"The author then gave an account of the two only cases of an analogous nature which he had met with in medical literature; the one related by Andral (*Clinique Médicale*, tome v. p. 339, 1834), the other by P. H. Green (*Medico-Chirurgical Transactions*, vol. xxv. p. 195), the main symptoms of both cases being in accordance with those observed by himself. He then touched upon the symptoms produced by section of the crura cerebri in animals, especially the circus movements described by Magendie, Lafarque, Longet, Schiff, and other physiologists, the absence of hemiplegia, and the occurrence of hyperæsthesia on the side of the lesion noted by Schiff. Dr. Weber did not endeavour to explain the discrepancy between the results of vivisections and the symptoms of disease in man. He alluded, however, to the differences in the pathological and experimental lesions themselves, and also in the connection of the different portions of the brain between themselves in man and animals. He wished by no means to disregard the results of the physiological experiment; but, on the contrary, thought that whenever any discrepancy existed, we ought to be very cautious in drawing inferences from pathological observations. He therefore did not consider as certain, but only as probable results of lesions of the centre, the internal and lower portions of the crura cerebri in man (the only parts which were diseased in the three cases related): 1. Almost perfect paralysis of the limbs of the opposite side as to motion, and great impairment as to sensation. 2. Less complete and more transitory paralysis of the opposite side of the trunk, of the face, soft palate, and tongue, as to motion and sensation (leaving the muscles of the eye intact). 3. A similar, but perhaps more permanent, impairment of the pneumogastric and sympathetic nerves of the opposite side. 4. A great retardation in the functions of the intestinal canal. 5. Immunity of the intellectcal faculties and special senses. 6. Paralysis of the third nerve on the side of the lesion, if the latter affects the nerve substance adjacent to the point of issue of that nerve.—*Lancet*, May 16, 1863.

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19. *Prolonged and Profound Sleep.*—Dr. J. W. COUSINS records (*Med. Times and Gazette*, April 18, 1863) the following remarkable example of this:—

"A farmer, æt. 43, has been subject at intervals during the last twenty years to attacks of deep and prolonged sleep. He has never suffered from any disease of the brain, or any other illness. The disorder commenced without any assignable cause in the year 1842, and continued nearly a whole year. It returned again in 1848, and having persisted without interruption for eighteen months, it left him entirely for the space of twelve years. The present attack commenced on May 19, 1860. Since that time he has not slept naturally.

"He retires to bed at night soon after 10 P.M., and almost immediately falls into a profound sleep, from which all the means at present adopted have failed to arouse him. He generally sleeps on his side, and appears like a person in refreshing slumber. His face and ears are pale; skin generally warm; but the feet are often cold and livid. Pulse slow and feeble; pupils generally somewhat dilated; respiration very gentle and shallow. He seldom moves, but occasionally he turns over from one side to the other. He never snores or moans. He awakes suddenly, without giving any warning, and he always seems refreshed, just as if he had slept naturally. Occasionally he complains of a slight pricking sensation in the forehead.

"The longest period he has ever passed in profound sleep is five days and five nights. Lately, he has frequently slept three days, and occasionally four without waking, but the average time is nearly two days. He is awake about four or five hours out of forty-eight. During these remarkable sleeps he never dreams, and the contents of the bowel and bladder are always retained. Before he falls asleep, he says that he "sometimes feels stupid;" but this is the only head symptom he ever complains of. His memory is good. When he awakes he remembers everything that happened the day before he began to sleep, and always asks, 'How long have I slept?'

"Lately, he has looked pale, and has lost flesh. His appetite is good, and the bowels are active. His manner is quiet and his disposition amiable. He is a good man of business, and is fond of reading. In intellectual power he is by no means deficient, but his early opportunities have been limited.

"During the attack in the year 1848, he frequently suffered from spasmodic trismus, which generally commenced soon after he awoke, and persisted for many hours. His jaws were always firmly locked, and at the same time he complained of pain in the back and neck. This affection, however, has never reappeared."

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20. *Incubation of Hydrophobia.*—M. Renault informs the Academy of Sciences that during the last twenty-four years he has, at Alfort, made numerous experiments for the purpose of learning the period of incubation of hydrophobia in the dog. During that period, 131 dogs have, under conditions (which he describes), been either bitten by mad dogs under his own observation, or have been inoculated by him with the foam as immediately collected from the mad animals. Of this number, 63 having presented no signs of disease during the four subsequent months, were not further observed. Of the 68 others, the hydrophobia was developed at various periods, as shown in the following table:—

In 1 dog	between the	5th and	10th day.
4 dogs	"	10th and	15th day.
6 "	"	15th and	20th day.
5 "	"	20th and	25th day.
9 "	"	25th and	30th day.
10 "	"	30th and	35th day.
2 "	"	35th and	40th day.
8 "	"	40th and	45th day.
7 "	"	45th and	50th day.
2 "	"	50th and	55th day.
2 "	"	55th and	60th day.
4 "	"	60th and	65th day.
1 dog	"	65th and	70th day.
4 dogs	"	70th and	75th day.
2 "	"	80th and	90th day.
1 dog	"	100th and	120th day.

British Med. Journ., Feb. 21, 1863.

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21. *Action of the Hypophosphites of Soda and Lime, the so-called "Specific" for Tubercular Diseases.*—Dr. R. P. Cotton has instituted some experiments with these boasted specifics of Dr. Churchill in consumption, at the hospital for consumption, Brompton, and relates (*Lancet*, Nos. for April 25th and May 2d, 1863) 12 cases in which he employed those articles. The following are his conclusions:—

In taking a general review of these 12 cases, it should be remarked in the first place that they were, with only two exceptions (Nos. 1 and 2) of a promising class; for if either an unpromising or hopeless set of cases had been selected for the experiments, it might reasonably have been urged that the hypophosphites had not had a fair trial. Of the twelve patients, six improved more or less under treatment; and in six the disease progressed. Of the six unimproved cases, two improved in a greater or less degree under subsequent treatment; whilst each one of the six cases which underwent improvement did just as well, and, in at least two instances, apparently better, under equally simple treatment. In every case the greatest care was taken to observe the *immediate* effect of the phosphatic salt, and in no one instance was Dr. Churchill's statement that "from the very first day there is frequently observed a remarkable increase of nervous power," &c., verified. No particular effect, indeed, seemed to accompany its use; and in no case was the substitution of the simple mixture of carbonate of soda and syrup attended with any alteration in the symptoms, and only once was such a substitution detected by the patient. Whenever the change was

made it seemed to matter nothing, so far as the disease and its symptoms were concerned, whether the patients were taking the one mixture or the other.[1]

If there existed even the minutest *specific* action in the hypophosphites, it would surely have exhibited itself in some way or other in the course of these experiments. Even in the two unpromising cases (Nos. 1 and 2) we might fairly have looked for at least an amelioration of some one or more of the symptoms; whilst it is only reasonable to expect that any "specific" relation between the hypophosphites and tubercular disease would have been rendered apparent when, in some of the other cases, the *hypophosphite* of soda was exchanged for the *carbonate*.

I have no hesitation in declaring my conviction that the hypophosphites of soda and lime have not the slightest *specific* action in tubercular diseases, and that the benefit which may sometimes follow their employment is solely attributable to their simple, unirritating, and alkaline properties. I believe, indeed, that in the soda and lime dwells their chief if not their only usefulness. In this conclusion Dr. Risdon Bennet, in the paper to which I have already referred, perfectly coincides. In the few cases in which he found the hypophosphites serviceable he attributes the benefit to the abandonment of tonics unsuited to the irritable condition of stomach in the particular cases, and states his belief that "*The patients would have been as well with a little lime-water, citrate of potash, or any other equally innocuous agents.*"

Phthisis is ever different in its character and symptoms. Some cases need tonics, some require only the most simple treatment, whilst others seem to yield as well if not better to good plain diet and sanitary conditions than to any kind of medicine. I have over and over again kept patients for weeks together under no other *medicine* than a simple mixture of gentian and hydrocyanic acid, combined, according to special circumstances, either with soda or a mineral acid; and I have known many such patients leave the hospital with all their symptoms arrested, and calling themselves "cured." Yet no one, I should imagine, would on that account give the title of *specific* either to gentian, soda, or a mineral acid. There is no medicine, however potent or however mild, which might not be called *a specific for consumption*, if only a certain number of cases be taken into account, and if the many circumstances which may have conduced to their improvement be either carelessly or wilfully overlooked.

Some time back I met with a physician who assured me that he had seen the very best effects from the hypophosphites. Upon inquiry I found that he had been in the habit of prescribing either the hypophosphite of *iron* or *quinine*, or both of them together. Such a trial I deem most inconclusive. We know that both the *citrate* of quinine, and the *citrate* of quinine and iron are also excellent remedies in many cases of consumption; but it is clear that it is to the base and not to the acid of these salts that their good effect is due. It is no more the *hypophosphorous* acid in the one instance which is beneficial than it is the *citric* acid in the other.

My recent experience of the hypophosphites is not limited to the twelve cases I have described. I have tried both the hypophosphite of lime and of soda in seven or eight other hospital patients, special notes of whose cases were not taken. In one of these, in which dyspepsia was a prominent symptom, I *commenced* with the carbonate of soda and syrup mixture, under which for three weeks the patient rapidly improved. The hypophosphite of soda was then taken for three successive weeks with continued improvement; after which steel was administered with equal advantage. In this case not the slightest difference

[1] The following statement upon these points is from a note by Dr. Rutter, the resident clinical assistant at the hospital: "In the advanced cases the disease progressed apparently not in the least affected by the hypophosphite. In more favourable ones, different degrees of improvement took place during its exhibition, but in none of these was the change for the better greater or more rapid than is commonly effected in such cases by the hygiene of the hospital, aided perhaps by other medicines. Cases which were improving under the hypophosphite continued to do so in an equal degree when a mixture made of simple syrup with a little bicarbonate of soda was substituted for it."

was observable with the change of treatment; a similar effect and equal benefit seemed to follow each of the remedies, and if the title of "specific" were due to the hypophosphite, it was equally deserved by the carbonate of soda and the steel. This was, in fact, a simple case of consumption, the type of hundreds of others, in which the most simple treatment is the most successful, and in which rest and improved diet, with proper hygiene, are the chief agents for good. In the remainder of these cases the general results were the same as in those I have detailed, the phosphatic salt invariably exhibiting itself as a simple, unirritating substance, adapted like many other simple alkaline salts, to certain varieties of consumption, but having not even the shadow of a claim to anything like "*specific*" influence upon tubercular disease.

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22. *Action of Phosphoric Acid upon Phthisis.* By R. P. Cotton, M.D.—Phosphoric acid has been so long and successfully used as a tonic and antiseptic, especially in cases of depressed nervous power, that some good result might reasonably be expected from its administration in many cases of phthisis. With a view of testing its influence, I prescribed it, as in my previous experiments, in twenty-five cases of chronic and uncomplicated consumption, and carefully noted the results. Of these twenty-five cases, twelve were in the first stage, four in the second, and nine in the third stage of the disease. Fifteen were males and ten females.

Three patients experienced great improvement whilst taking the phosphoric acid, eight improved a little, and fourteen of the cases seemed either to derive no benefit or to become worse. None of them increased materially in weight, the greatest increase not exceeding two pounds, except in one instance, where seven pounds were gained, but in this case it was afterwards found that cod-liver oil had been taken in addition to the phosphoric acid.

Two of the greatly improved cases were in the third stage of the disease, and it was generally observed that most of the improved were either in an advanced condition of disease or belonged unmistakably to what is commonly understood as the cachectic class, leading to the conclusion that the phosphoric acid acted simply in virtue of its general tonic and upholding influences, and not from any specific action upon the tubercular disease.

It was prescribed in doses of fifteen minims of the Acidum Phosphoricum dilutum of the London Pharmacopœia, in a little water two or three times a day. As a general rule it agreed very well with the patients, improving the appetite and diminishing undue secretion, whether from the skin or mucous membranes. In four cases, however, it was discontinued, seeming to produce griping pains in the bowels, together with nausea and diminished appetite.

In estimating its effects, even in the most satisfactory cases, it appeared to me that the improvement was inconsiderable in comparison with what had previously been noticed in some other remedies; whilst several of the patients who either improved very slightly or doubtfully under the phosphoric acid, improved afterwards under other treatment. Four of the patients improved greatly in health when steel wine was taken in conjunction with the acid, the latter being given twice a day, and the former immediately after dinner. It will be remembered that a combination of steel wine with quinine was formerly found to be productive of good in a considerable number of cases (*Medical Times and Gazette*, August 30, 1862).

Upon the whole, I confess to having been disappointed in the action of phosphoric acid taken singly. In some cases, however, where it has been prescribed either with other tonics or in chemical combination with iron, I have found it of great use in the treatment of phthisis.

From these observations I have arrived at the following conclusions: 1. That the dilute phosphoric acid acts beneficially as a tonic in certain consumptive cases; but that, as a general rule, it is inferior to some of the other mineral acids. 2. That when taken in conjunction with iron its good effects appear to be considerably enhanced.—*Medical Times and Gazette*, May 30th, 1863.

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23. *Therapeutical Value of Cod-liver Oil in Chronic Convulsive Diseases.*—Dr. Anstie read a paper on this subject before the Western Medical and Sur-

gical Society, Feb. 20th, 1863. The author's attention had first been directed to cod-liver oil as a remedy for affections of this class in consequence of his obtaining some years ago an unexpected success with it in a case of chorea, which had resisted all the ordinary modes of treatment. The convulsive diseases in which the author has employed cod-liver oil are paralysis agitans, simple epilepsy, chorea, and mercurial tremor, and in all these affections it has appeared to be more constantly useful than any other medicine. Of paralysis agitans, four cases were detailed, of which three were very decidedly improved, and one of them may have been said to be cured, although the affection had been very severe. Of chorea, one case was detailed, and others were alluded to, in which the benefit produced was very marked. Of mercurial tremor, one most remarkable case was related, in which the cause of the mischief was a very unnecessary salivation inflicted by medical authority some thirty years previously; the patient was attacked immediately afterwards with dreadful tearing pain in the muscles of the forearms and calves, and with violent muscular tremors, and ever since that time she has been liable to a recurrence of the symptoms when much fatigued or depressed from any cause. On application to Dr. Anstie, at the Chelsea Dispensary, cod-liver oil was prescribed and persisted with for five weeks, at the end of which time all the symptoms had perfectly disappeared, the patient declared that she had never been cured before in less than six or eight months, and she doubted whether any other medicine than the oil had ever really done her any good. Twice since she has had slight recurrence of the symptoms, but a short course of cod-liver oil has on each occasion given complete relief. Of simple epilepsy, twenty cases were given, in which the treatment had been confined to the use of cod-liver oil. Of these there were five upon whom no good effect whatever was produced; seven had completely recovered; two had disappeared from supervision at a time when they were rapidly improving, although they could not be said to be cured; in two others the mental symptoms had greatly improved, but the fits remained as before. Four patients remain still under supervision; in two fits have ceased, although there are still frequent prodromata; and in the remaining two but little good has yet been effected. Besides this general summary of results, Dr. Anstie detailed the particulars of three cases which from their severity might be said fairly to test the remedial power of the oil. The patients were respectively a girl, aged 17, a boy, aged 13, and an infant, aged 7 months; in all of them the fits were very frequent and severe, and the nervous system exhibited signs of great depression. The case of the infant was specially noticeable, because it was proved by microscopic inspection that the milk of the mother was very deficient in oily matter, and it appeared that in a former infant of the same mother precisely the same train of symptoms had appeared, and had terminated fatally. In all these three cases the treatment had proved perfectly successful, and the author commented strongly on the fact that in all these cases the general nutrition of the body had been excellent, and only that of the nervous system had appeared deficient, and said that the conclusion appeared inevitable that the oil had expended itself in enriching the nervous centres. This, indeed, was the principal point of the paper. The author directed attention to Dr. Radcliffe's remarks on the necessity of fat to the nutrition of the nervous centres, and mentioned the fact that that gentleman had found cod-liver oil of the highest value in the treatment of convulsive diseases. He observed, also, that the beneficial action of cod-liver oil was quite consistent with what we know of the action of the few other remedies which careful therapeutical investigation has credited with a really beneficial action in chronic convulsive diseases. Steel, arsenic, quinine, all these may fairly be spoken of as foods. With regard to sedatives, the author remarked that in the first place the good effects which could be expected from them were chiefly temporary, and such as result from breaking through for a time the evil habit, so to speak, of convulsive action. Secondly, and this was most important, there was strong reason to believe that it is not the really narcotic effects of these remedies which are of service in preventing or arresting convulsive action, but merely the stimulant effects which can be obtained from small doses; for there is no class of remedies which is more useful in preventing or arresting convulsions than the pure stimulants. The author

concluded his paper by deprecating strongly any return to the absurd system of hunting about blindly for "specifics" for chronic convulsive diseases. The progress of clinical observation was blasting the reputation of one after another of the strange, out-of-the-way remedies which had once been accepted with the blindest faith, and was pointing unmistakably to a rational treatment of convulsive diseases by means of medicines whose action it is possible to understand. —*Med. Times and Gaz.*, March 28, 1863.

24. *Hydrochloric Acid in Typhoid Fever.*—Dr. Henderson, Medical officer to the Chinese Hospital, Shanghai, records the occurrence of pure typhoid fever amongst the natives of Shanghai during the months of November and December, 1862, and claims great success in his treatment of it by hydrochloric acid. He believes that in typhoid fever the effect of hydrochloric acid is as decidedly beneficial and specific as that of quinine in ague. He explains the good effect of the acid by reference to the excess of amonia given off from the body during destructive metamorphosis of the tissues, and argues from the fact that ammonia injected into the veins of animals is capable of producing symptoms of a typhoid character. The same line of reasoning, we may observe, was several years ago taken by Dr. Richardson. A form of dysentery, also of a typhoid character, occurs at Shanghai. In this disease Dr. Henderson found the blood to be more alkaline than in health, and again the acid treatment was followed by the very best results.—*Medical Times and Gazette*, May 30th, 1863.

25. *Ozæna.*—Dr. Oliffe relates (*Revue de Thérapeutique Medico-Chirurgicale*, May 1, 1863) a case of this very intractable affection, successfully treated by injections of a solution of permanganate of potash. He employed the injection every three hours for some weeks, alternating the permanganate of potash with the chlorate of potash to the interior and by injections.

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

26. *Gunshot Wounds by Modern Weapons.*—A. Neill, Assistant Surgeon 65th Regiment, has published (*Edinburgh Medical Journal*, 1863) some very interesting observations on these injuries.

"Gunshot wounds," he says, "have been written about ever since gunpowder was discovered; and wounds caused by a leaden bullet are treated of by Celsus previously to the introduction of gunpowder, the characters of which were very similar to those of the present day, but of course not of so severe a character. Bones and arteries were seldom injured, and the wounds were generally contused and lacerated, owing to the small amount of impetus given to the ball. *Deaths* from these leaden bullets were not frequent, and the imaginary poisonous effects of the introduction of the lead into the tissues seems to have occupied more of the attention of the surgeon in an endeavour to counteract its influence, than the more serious effects of the wound itself. Even so far back in the annals of medical and surgical history as the time of Celsus we read of the most approved plan of treatment to be followed in the case of wounds from leaden bullets, the correct mode of discovering them, with the after-treatment of the wound, which in those days must have caused more misery and suffering than the infliction of the injury itself; and I have no hesitation in saying that a patient had a much greater chance of losing his life under the surgical treatment of his wounds than by any direct injury done to his body by the bullet itself. Of course, the first thing the surgeon did was to remove the foreign body, which was generally imbedded in the soft tissues; then he proceeded to enlarge the external wound, under the supposition that the poisonous effects of the lead would escape from the system with the loss of blood. Then numerous and varied hot poultices were applied—almost every surgeon having his own

favourite form of it—in which lay some subtle virtue for the extraction of the poison from the wound. Plasters of different sorts, and various healing cataplasms were used. The wounds were encased in these filthy messes, and the process of suppuration speedily setting in, the pus not being allowed a vent, and the contact of clean water or fresh air being considered most prejudicial, can we be surprised at the deaths that resulted from these forms of treatment? The crowded state of the hospitals of those days, the want of attention to proper ventilation, the intolerable stench of the putrid discharge from their wounds, not removed more frequently than once a week at the oftenest, and the inevitable result of this, the formation of maggots in the wound, induced those forms of low fever by which we have lost so many fine soldiers, and which swept off the unfortunate creatures by scores.

Very little alteration in the treatment of gunshot wounds was made until the commencement of the Peninsular war, and even during the early part of it the same mode of treatment was pursued; but owing to the great losses of men from deaths in hospitals having occasioned some inquiry into the treatment of wounds in general, it was resolved to abandon the system previously in vogue, of invariably making the wound larger than it was by incision, and instead of the hot poultices and dirty plasters, to adopt the more sensible plan of cooling applications. And as it was found that the patient's general health was injured by having his wounds always saturated in the pus discharged from them, instructions were given to endeavour to keep the parts as clean as possible, and to change the dressings "more frequently" than once a week. Since then great advances have been made in military surgery, and we now appreciate the absolute necessity of avoiding over-crowding in hospital wards, of paying great attention to proper ventilation, of keeping the wounds well washed in cold spring water, and never allowing any offensive smell to arise from the collection of pus, thus conducing to the patient's comfort and general health, which formerly were never studied. The consequence of this mode of treatment is, that we now have cases of men recovering from wounds almost always looked on formerly as fatal. We seldom or never hear of hospital gangrene, or any of those diseases created in the wards of an hospital where a number of cases of wounds discharging pus are under surgical treatment.

In the present day our missiles of defence and offence consist of the rifle and bayonet, smooth-bore gun, pistol, cannon of various calibre and formation, calculated to throw either round shot, or cylindrical shot, or shell percussion, as in the Armstrong gun, or with a fusee, as the old gun. Then we have the mortar and cohorn, for a vertical fire, to use an artillerist's expression, calculated to throw shell. Then for the smooth-bore cannon there is the solid shot, the grape shot, and the canister shot, which in their names express their form of composition. Bar shot are two large shots welded together, with an iron bar between; and chain shot, with a chain between two large shot, which are calculated to mow down like a scythe, making fearful wounds. The two latter are used chiefly against bodies of horse, and on shipboard. The shrapnel shell is a hollow sphere of iron, filled partly with gunpowder, and partly with pewter or iron balls of small size. The common shell is an iron sphere filled wholly with powder. The musket ball is round and solid, of lead. The rifle bullet is an elongated, expanding, cylindrical, conoidal projectile, as the musketry instructors tell us, weighing about one ounce, and calculated to travel an immense distance, and at a very great rate. The wounds caused by cannon shot and shell are fearful, and those by the rifle bullet, though not so severe to look at, are often most dangerous. It is a difficult thing to judge which form of weapon is the most destructive of life. Against masses of troops the cannon is no doubt very efficacious; but then, at certain ranges, the rifle is equally so. The characters of the wounds inflicted by these various missiles are equally varied. Shot and shell tear away large portions of the body; and I have seen legs and arms stripped off, one half of the chest quite cut away, and the body cut in halves by cannon balls. Shell generally, by exploding in fragments, either impact themselves in the tissues, making wounds frightful to look at in extent, or merely cut away portions of the body. The wound of the rifle bullet is, of course, very small, and apparently very innocuous compared with the large-shot wounds, but

they are just as efficacious in the destruction of life. To give an illustration of the force with which a cannon ball must travel, I may mention that I saw a case where a man had all the ribs, both clavicles, and one arm fractured by attempting to catch and stop a round shot, which was apparently spent, and was rolling along the ground in an innocent manner. He caught at it, and was thrown down, struck on the chest, and the shot rolled over, leaving him in articulo mortis. In this case a portion of fractured rib had passed through the pericardium, and wounded the substance of the heart. What are called spent rifle balls are capable of inflicting much and severe injury, and always make an extensive bruise. To show the effects of being hit with a spent ball, or one that has lost its greatest impetus, I may mention a case that came under my notice, where a colonial volunteer was standing talking in a group of his comrades during an action, and was struck by a ball in the abdomen, over the region of the bladder. The ball fell on the ground at his feet, without either injuring his clothes or even marking the skin. He did not feel much pain at the time, and walked to the hospital a distance of two miles, with the ball in his pocket, without feeling much pain, but he died shortly afterwards from peritonitis and extensive inflammation of the bl..dder. The entire surface of the abdomen presented the appearance of a severe bruise in a few hours after being struck. I could mention several other cases more or less bearing on this point, but they only help to prove the fact, that a spent ball can kill without wounding the integument, and show how small an amount of injury will often take away life; but, on the other hand, it is wonderful how great an amount of injury the human system can endure without succumbing under it. Both legs may be shot away, with great loss of blood, and amputation be necessary afterwards; yet, with such mutilations, death is not always the result.

One of the first peculiarities of gunshot wounds to be mentioned is, the shock to the system, which is generally present in a greater or less degree; but it is not always the case that in very severe and dangerous wounds the amount of shock is very great. I have seen some instances of comparatively trifling wounds where the extreme prostration of the vital powers seemed to indicate much injury, but on examination discovered no dangerous wound, or even great loss of blood. The shock does not always bear a marked relation to the severity of the injury; it seems to depend greatly on the constitution of the patient. To his mental powers and his physical conformation may be ascribed many of the anomalies we observe in this state of the nervous system. Ballingall has noticed this in his excellent work on *Military Surgery*, and ascribes it to the same causes. However, it is an undoubted fact that when a person feels himself wounded, let his self-possession and his coolness be what it will, he cannot help feeling an irresistible tremor and nervous agitation, even though it lasts only for a few moments. In some persons the power over the feelings is brought under the domination of the will, and consequently such people speedily regain their self-possession, and will submit to any operation, or endure any amount of pain, without changing even the expression of their countenances. To the suddenness of the injury, and the uncertainty of the amount of danger to life which is sustained on the instant, and when the mind has been engaged in some other manner, and perhaps in a high state of excitement at the time, may be ascribed this peculiarity; and in which instant the reason can see nothing but extreme danger. The amount of the shock to the system is to be observed and studied, and is of immense importance in determining as to the performance of any operation at the time of the injury, or deferring it until some other period when the nervous system shall have recovered its power, and the mind its equilibrium.

It is a matter of serious import to us when we have a patient on the field who has received a wound which we know requires the performance of some capital operation, such as the removal of a limb (and who is at the time in a state of complete shock, which of itself is sufficient to destroy life), to determine what to do in such a case. The nature of the injury, its situation and extent, must be the first inquiry, and a hasty opinion formed in the mind as to its probable result, so as to determine the question of immediate operation to save life, which may be ebbing fast from loss of blood or shock. It is advisable, if possible, to

defer any capital operation till the patient be removed to a more suitable operating theatre than the open field; and it requires no small amount of nerve and decision of character to enable the surgeon to contemplate calmly the necessary steps to be undertaken when in action.

Gunshot wounds of every variety are classed in the Army Medical Reports, under the heading of Vulnus sclopitorum, though they might with more propriety be subdivided into simple and compound. The mere *flesh wound*, caused by the passage of a ball through the soft parts without involving injury to bone, artery, or nerve, being one subdivision; and the more *complicated* injury, where fractures of bone and other dangerous lesion has occurred. Gunshot wounds are sometimes classed as mortal, dangerous, severe, and slight—each of which bears its explanation in its name. The characters of a gunshot wound are those of a contusion and laceration of all the tissues. Sometimes they are so simple as to bear resemblance to a punctured wound, particularly if a rifle ball, revolving on its long axis, has passed through the soft part at a great speed; but within a few hours it resembles a contusion. The wound of entrance, as it is termed, bears no comparison in either size or shape to that of exit when a rifle ball has caused the injury. In the former you see the edges of the wound curving inwards, and its circumference small, with little or no hemorrhage. In the latter the wound is large, with torn and irregular edges projecting outwards, and perhaps only slight oozing of blood. In a short time, averaging an hour, around the entrance wound slight redness begins, gradually extending to about two inches around its orifice. Again this colour changes to blue or greenish black, and you see all the appearance of a severe bruise, with a small wound of the skin, its edges still curved inwards. In the exit wound the discoloration of the skin is not apparent. Inflammation quickly sets in throughout the whole course of the wound, and suppuration more or less profuse follows, with sloughing of the injured tissues. During this stage secondary hemorrhage is to be looked for, if in the course of the missile an artery has been injured or approached too closely; but loss of blood from a wound of this description is not frequent. Pain is great in the injured part, and much increased by motion of the limb; cicatrization throughout the whole course of the wound sets in, and in this manner heals. By care, and with every circumstance favourable to recovering, a patient may soon be going about once more, and have no ill effects from a wound such as I have described. Great loss of substance in the tissues is also well marked, induced by the suppuration of a slough more or less extensive.

The treatment to be pursued in a case such as I have described is very simple; the wound must be examined and sponged, any foreign body, such as shreds of clothing, &c., removed, and in suitable localities uniform pressure may be applied; in a simple wound union by the first intention may be induced by closing the orifices and applying slight pressure by bandage, with attention to the position of the limb by giving it complete rest. In one case I saw this result well marked, where the ball passed through the muscular part of the upper arm in its anterior aspect. The wounds were immediately closed from contact of air by isinglass plaster, and a bandage applied. The arm was supported in a flexed position, and cold water abundantly used to keep down inflammation. The orifices of the wound were quite healed, and the arm in use ten days afterwards. In a similar case, where a different plan of treatment was followed, suppuration set in, and the arm was useless for three months. With water, either cold or tepid, I have seen many almost miraculous cures effected. I consider that in cases where the vitality of the soft parts has been partially destroyed by bruise, tepid water and lint are very necessary as assisting to bring back the vitality, after which cold water may be applied with much benefit. In cases of compound fracture of the long bones with gunshot wound, after the limb has been put up in splints and bandages, cold water will prove the best application, kept constantly dripping over the wound, which must not be closed over by either splint or bandage, but so arranged as to be quite exposed to the water. In seven cases of this description, four were gunshot wounds with fracture of the humerus, in three of which the ball passed out, and in one the ball was lying in the bone and was at once extracted. In these three the arm was put up in the

usual manner as for fracture, but leaving the external wounds exposed. The patients were kept in bed with the arm flexed and so arranged, that a constant stream of water was kept trickling over it, carrying off the pus discharged. A pail was made and raised over the bed, with a tube so placed as to carry a small stream from it to the limb, and regulated so as to change the temperature of the water occasionally if needful; one case was fracture of the tibia in its lower third, and one fracture of both bones of the forearm, with two external wounds. In the former case the man was aged 24 years, and three months after recovering was killed accidentally. On dissection of the leg I found that the fracture had extended down to the joint of the ankle, and both pieces of bone were joined perfectly—the mark of union was most distinct. In all these the plan of treatment by cold water was adopted with successful results.

In fifty cases of gunshot wounds, including all descriptions, treated thus by local applications, a successful issue was obtained. Gunshot wounds of the head and face generally terminate fatally, but if no very serious lesion of the brain occurs, much may be done to save life in the treatment. I have noted one case where a man was shot in the head; the ball entered the left eye, and passed into the brain from below upwards; the patient was aged 21 years, of good general health, and of abstemious habits. He was found apparently in articulo mortis; great hemorrhage had taken place, his face and hair being covered with blood. I washed away the blood, and gave him weak brandy and water in small quantities. He was unconscious, and his pulse was scarcely perceptible. After getting the stimulant, his pulse gradually got stronger, and he seemed more conscious, though not able to speak. In four hours I looked again at the wound; blood was oozing from it, and a substance resembling that of the brain itself. His pulse was now small and rapid, and he was quite unconscious and unable to swallow. He had croton oil dropped on his tongue; his head was shaved; cold water was kept trickling over; the stimulant was stopped. The eye was quite destroyed, and was removed on the second day; after which time he seemed to improve, but still remained unconscious. Soup was administered by the stomach-pump every day. The only topical application was lint and cold water. It is needless to follow out this case. The patient gradually recovered; the bullet being somewhere in the brain, having no doubt become encysted. The only remarkable thing that occurred in this case was, that paralysis of the right side of the body occurred, the opposite to that on which the ball entered. His general health is good, and he has never had convulsions or epilepsy.

Gunshot wounds of the cavities of the body are always dangerous, but not always fatal. In one case of a soldier the ball passed through the right side of the chest, fracturing one rib, and passing through the lung out at the back near the spinal column. The same man was shot in the left breast, the ball not passing out. This was a serious case. There was great cough, with expectoration of blood in large quantities; bloody froth bubbled out from both wounds; there was also much difficulty in breathing. The right side of the chest was fixed with broad strips of plaster, passed round from over the spinous processes of the vertebræ to the front part of the chest, leaving the wounds exposed; this side of the chest was thus prevented from moving, and gave the lung rest. The opposite side was merely covered with bandages. The patient was supported in a sitting posture. Cold water and lint were applied to the wound. He had muriate of morphia at night to give sleep, and his strength was kept up by nourishing soups. Purgatives were administered when required, and small doses of antimony, in the form of James's powder, were also given along with an expectorant mixture to allay cough. Three weeks after being wounded, and when going on well, he had a violent attack of congestion of the left lung, which was relieved by cupping. This man is now tolerably well, and is invalided from the service. In another case, where the left lung was wounded by the stab of a bayonet, and where the same plan of fixing the chest by plaster along with cold water applications was adopted, complete recovery followed.

Much attention must necessarily be given to position in the treatment of gunshot wounds. The head must be kept raised in wounds of the thorax, so as to relieve the breathing. Fixing the chest by means of the adhesive plaster gives

great relief to the breathing, and, as I know from experience, changes the condition from torture and extreme agony to comparative comfort.

In the limbs, wounds of the arteries and large nerves always require amputation; but when the artery alone is wounded, the only operation necessary is to cut down on and tie it. The treatment, of course, being—proper position of limb, complete rest, and cooling applications, such as the water dressing.

When a ball passes through the carpus or tarsus, even though much smashing of the bone takes place, without lesion of an artery, the member may be saved. In five instances of such wounds, three in the carpus and two in the tarsus, both hands and feet were saved by adopting the antiphlogistic plan of treatment with water dressing, and the removal of dead bone when it is loosened and acting as a foreign body. Occasional poultices are useful in cases of this sort so as to favour suppuration, being careful to keep them clean and frequently changed. The use of poultices in gunshot wounds is generally to be avoided. They are superseded in their effects by lint and warm water kept constantly trickling over the wound, and only induce putrefaction of the purulent discharge.

When bleeding takes place from a small artery, it may be stopped by the pressure of a bandage, which always becomes necessary when there is œdema of the part. In much smashing of the small bones, bandage and splint will, in a measure, maintain the shape of the foot or hand, which would otherwise become distorted. I have been induced to adopt as my treatment the topical applications of cold water, solely on observations among the aboriginal natives of New Zealand, where from time immemorial they always carry their wounded to the edge of some stream, so that a constant supply of water may be at hand; and in the case of fractured bones, after putting them up, they pour water constantly over the injured part, and many have been the cures that have been thus effected.

Much depends on fresh air as well as fresh water; however, the former is not always supplied in our hospitals, but the latter not so liberally as it should be in surgical cases.

Many and various have been the instruments constructed for extracting bullets. All sorts of forceps and with as many improvements and varieties as weeks in the year nearly; but I am sure all will concur with me, that with the common bullet-forceps any bullet may be extracted, and the only instruments needful for the field are tourniquets, with pad-strap and buckle, scalpel and forceps, with curved needle and silk thread, lint, adhesive plaster, and bandages. By the plan of treatment I have advocated I do not doubt that I have witnessed cures effected where death would have resulted under any other. The plentiful and constant applications of cold water to wounds (either gunshot or by the surgeon's knife) will heal them in a much shorter time and with less discomfort to the patient than any other treatment. Every surgeon has his own favourite plan of treatment, but none will ever supersede the cold water.

It is said that the Minié conical ball makes a more severe wound than the round, but not if it revolves in its long axis, as it then pierces the tissues, not tearing them; the least obstruction to its course will, however, alter its motion; and if it then revolves on its short axis, of course, by its greater length, will create a larger wound than the spherical ball.

Erysipelas is a frequent result of gunshot wound, and generally of a severe character, causing much sloughing in and around the soft parts, difficult to subdue and always to be dreaded when in a severe form. It often supervenes in cases where the shock has been great, and where a large amount of stimulants have been administered. In such cases, where it might be feared that erysipelas would set in, I have given potassio-tartrate of antimony in small doses, as soon as the shock subsided and reaction set in, thus anticipating the attack, if I may so say, and in no case in which it was administered have I seen erysipelas; but when it does show itself, the usual means of treatment must be adopted, and changing the form of local applications from cold water to warm. I have never seen a case of gunshot wound in which erysipelas set in, where the shock of the system had not previously been severe, though in two instances the wounds were slight. After amputation, acute bronchitis is to be feared, causing much danger to the patient. In seven cases of secondary and four of primary amputation,

I saw acute bronchitis attack the patients, generally commencing about the fifth day after operation, for which no reason could be assigned. The season of the year was in summer with fine weather, and the patients had every care taken of them previously. An attack of acute bronchitis supervening on an amputation or severe gunshot wound is of an aggravated type, and seems less amenable to ordinary treatment than the usual bronchitic affections, and as the purulent discharge from the wound is considerably diminished in quantity, when the first symptoms of the affection show themselves, and is through the whole course of the disease abnormally small in quantity, so, on the return of the pus in increased quantity, the bronchitis gradually disappears, and the wound assumes a more healthy aspect. This occurrence of bronchitis after amputation has been frequently remarked by authors, but I do not know of any cause for it being assigned by them, or any notice taken of the almost total disappearance of the purulent discharge during the attack. The ordinary remedies have been given for the treatment of it; but till the reappearance of the pus, little benefit seemed to be derived from the usual plan of treatment. Pyæmia is a frequent result of gunshot wounds, but it may often be avoided if proper precautions be taken. Tetanus is more frequently seen now than pyæmia; and for its cure most of the articles in the materia medica have at some time or other been proposed, but none seems of so much use as the continued use of opiates and chloroform.

In the course of treatment in gunshot wounds, diarrhœa and dysentery are very frequently most annoying to the patient, and reduce the strength very rapidly. In these cases I have found nothing so speedily beneficial as powdered charcoal in one-ounce doses, five or six times a day, and it has invariably checked the diarrhœa. Through the whole course of treatment, I have found that the tincture of the muriate of iron in small doses, twice daily, has been of much service, and has changed the appearance of the wound in a few days after amputation, when of an unhealthy aspect, to a fine healthy look, where the consistence of pus changed materially. I have given it in thirteen cases of gunshot wounds, from the seventh day for a period of about a month or six weeks, with the most satisfactory results. Of styptics in gunshot wounds the best is tincture of matico poured on lint and passed into the wound, when it has acted as a charm in allaying hemorrhage, and should always be in the pocket of the surgeon when in the field; but styptics are generally to be avoided, as they seem to induce attacks of erysipelas, or at least favour its production.

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27. *Remarkable Case of Injury of the Head, in which the Right Restiform Body and the Right Posterior Column of the Spinal Cord divided Transversely.*—Dr. A. T. H. Waters, of Liverpool, read to the Royal Medical and Chirurgical Society (April 28, 1863) the following case:—

John M'Bride, a sailor, aged twenty-three, was admitted into the Liverpool Northern Hospital about noon on the 19th of February, 1863. He had received a blow on the side of the face on the previous day from a capstan bar, which stunned him for a short time. On presenting himself at the hospital he was able to walk with assistance. When seen by the author he was in bed. He was quite conscious, understood everything, and spoke rationally and distinctly, although articulation was not quite perfect. He complained of slight dizziness of the head, and slight numbness of the right side of the face and of the right arm and leg. He was unable to swallow, and had constant hiccough. The face was dusky; the breathing quiet; the pulse 100, and regular; the tongue was protruded in a straight line; the uvula was drawn to the right side. There was partial loss of power over the right side of the face, and right arm and leg; both these limbs could, however, be readily raised. He could open and shut both eyes. The pupils were rather dilated; the eyeballs constantly rolling about. No affection of vision or of hearing was complained of. The right side of the face and the right arm and leg were of higher temperature than the corresponding parts of the opposite side. The patient said he could distinctly feel when touched on either side of the face, on either foot, leg, or arm. Sensation appeared slightly less perfect on the right side than on the left, *but on both sides it was good.* The patient died, somewhat suddenly, at five P.M. on the day of

admission, after an ineffectual attempt to swallow. He had survived the accident about twenty-four hours.

After death the cranial bones and the vertebræ were found unfractured. The cerebrum was healthy. There was a considerable quantity of slightly coloured fluid at the base of the skull and in the spinal canal; the venous sinuses were very full of blood; the right hemisphere of the cerebellum was slightly and very superficially lacerated on its under surface, close by the side of the right restiform body. The medulla oblongata at its posterior aspect and right side was the seat of an extravasation of blood lying beneath the pia mater. This extravasation was into the nervous substance, and was connected with lacerations of that structure. The parts having been hardened in spirit, two transverse lacerations were found connected by a vertical one. The first or superior laceration involved the right restiform body about its middle; the laceration extended to within a very short distance of the median furrow of the fourth ventricle behind; to the outer side and in front the laceration extended as far as the line of origin of the eighth pair of nerves. Blood was effused between the lacerated parts, and separated them from each other. The nervous substance in the adjacent parts was also infiltrated with blood. The median furrow of the fourth ventricle was pushed a little towards the left side. As far as it was possible to judge, this laceration involved the whole, or very nearly the whole, of the fibres of the right restiform body, and a portion of the gray matter spread out on the floor of the fourth ventricle. None of the roots of the eighth pair of nerves were torn; but the laceration extended close to the superficial origin of the glosso-pharyngeal and par vagum, and no doubt involved their deep fibres. The second or lower laceration was situated just below and to the right of the nib of the calamus scriptorius. It had divided that part which is known as the posterior pyramid and the tract outside of it, which is the continuation of the posterior column of the spinal cord. The laceration extended about two lines into the nervous substance; it stopped behind at the median fissure, and externally it did not extend beyond the line of attachment of the posterior roots of the spinal nerves. Blood was effused as at the upper laceration. These two lacerations were connected by a vertical one, which ran down along the inner side of the restiform body, and terminated below by joining the inner part of the lower laceration. The lungs were loaded with black blood. The heart was healthy.

The author remarked that the importance of the case was in the fact that the parts which were formerly supposed by most physiologists, and still are by some, to be the sensitive tracts, were divided on one side without loss of sensation ensuing. The case was remarkable as presenting us with a repetition in a healthy man of those experiments so often performed on the lower animals by the physiologist—namely, division of certain portions of the cord or medulla.

The results of the case tended to confirm the views recently advanced by some physiologists, that the posterior columns of the cord and the restiform bodies are not the channels by which the posterior roots of the spinal nerves communicate with the sensorium; and to refute the opinion that those structures are concerned in that function.

With regard to the minor symptoms, they for the most part agreed in a remarkable manner with the lesion which was found. So severe a laceration of the restiform body could scarcely happen without involving the deep origin of the facial, the glosso-pharyngeal, and the pneumogastric nerves. Hence the symptoms of paralysis about the face, &c., which had been referred to. The immediate cause of death appeared to have been a sudden arrest of the function of breathing.

Dr. Waters said that, with perhaps one or two exceptions, he was not aware that any case of a parallel character had ever been placed on record. The results of the case, as regarded the symptoms, did not in the slightest degree invalidate the views of Sir Charles Bell as to the function of the posterior roots of the spinal nerves, but they were quite in opposition to the theory that the posterior columns of the spinal cord and the restiform bodies were the tracts along which sensitive impressions were conveyed to the sensorium. The partial division of the gray matter on the floor of the fourth ventricle—generally believed to be the continuation of the central gray matter of the cord—without

any loss of sensation following on the side opposite to the lesion, seemed rather opposed to the view that decussation of the conductors of sensitive impressions takes place all along the spinal cord; for, although only a portion of the gray matter was divided on the right side, yet if the sensitive fibres decussate before reaching the medulla oblongata, the left side of the body ought to have had a diminished sensibility, whereas the opposite was the fact—sensibility was diminished on the right side. The existence of increased temperature on the side of the lesion was also an interesting phenomenon; this and the somewhat flushed condition of the face were symptoms somewhat similar to those which follow an injury to the sympathetic. The author alluded to a case reported by M. Begin, in Longet's *Anatomie et Physiologie du Système Nerveux*, where one antero-lateral column of the cord was divided by a sharp instrument, the posterior columns and the central gray matter being uninjured. In that case there was loss of power of the affected side, but no loss of sensation. The case he had reported, coupled with that of M. Begin, and taken with the experimental and pathological cases which have been already brought forward, seemed to prove beyond doubt that neither the posterior columns of the cord nor the restiform bodies were concerned in transmitting sensitive impressions. In conclusion, the author dwelt on the importance of a careful observation of such rare cases as the one he had related, which constituted, in fact, a repetition in man of the experimental inquiries so often made by physiologists. Such cases, when correctly observed, might serve to establish important physiological doctrines, as not being open to the objections which might be advanced against the results of vivisections in the lower animals, or the facts observed in disease in man.—*Lancet*, May 16, 1863.

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28. *Treatment of Nasal Polypi by Bichromate of Potash.*—Dr. Frédéricq states in a communication to the Society of Medicine in Ghent, that he has successfully treated twenty cases of nasal polypus by means of bichromate of potash. A saturated aqueous solution of the salt is applied by means of a small brush to the parts of the polypus within reach, care being taken to avoid the neighbouring tissues. The operation may be repeated several times. It does not generally produce distress or pain; but, at the end of about three or four days, the polypus becomes the seat of a kind of inflammation which extends sometimes to the nose. It swells up, and a watery and slightly acrid fluid often flows from the nose. This inflammation, however, need not give rise to alarm; it never lasts above two days. When the irritation has gone off, the polypus will be found to have partially or entirely disappeared. When the first signs of inflammation appear, the application is suspended, and is repeated when the irritation has ceased. It is not uncommon to find polypi cured in five or six days, after a single application. Relapses are rare after treatment by bichromate of potass, in polypi as well as in syphilitic vegetations. The cases treated occurred in females, most of whom had passed their fiftieth year. The tumours varied in number, size, and shape; all were mucous except one, which was fibrous, and which did not appear to be radically cured.—*British Med. Journal*, Aug. 2, 1862, from *Annales de la Société de Méd. de Gand*, March and April, 1862.

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29. *Conservative Tendency of Nature in Injuries.*—Mr. John Williams communicated to the Surgical Society of Ireland the following case, which strikingly illustrates the conservative tendency of nature in injuries:—

William B——, a healthy young man, 20 years of age, left England for Australia, to seek his fortune, in the month of November, 1860, in the ship *Queen of Commerce*. On the third day after sailing, while sitting on a "spree mast" which lay on deck, and which, he states, must have been badly lashed, a heavy sea struck the side of the vessel and coming over forced the former out of its berth, causing it to snap the ropes that tied it. Being thus loosened, it rolled across the deck, and throwing W. B. prostrate, passed over his lower extremities and nearly crushed him to death. Before I proceed further, I must premise that it is not obligatory on the owners of emigrant ships to provide surgeons for passengers if they be under a certain number—an *indulgence* essentially bad, and one that ought to be rescinded by the Board of Trade. When

he was removed to the cabin, it was found that "the right thigh bone was broken in the centre, the same hip injured, while the ankle of the corresponding limb appeared to have been sprained." *As there was no surgeon on board*, the precise nature of the injuries sustained by the right hip and left ankle-joint could not be known; but a kind and sympathizing fellow-passenger, a Mr. Young, set the broken thigh, as well as he was able, and, good Samaritan-like, watched and tended him carefully for the remainder of a voyage thus so inauspiciously commenced. During the greater portion of the passage, extending over three months, he was confined to his cabin, and inadequately can it be conceived what sufferings and inconveniences, caused by the rolling of the ship, and the great privations experienced by invalids at sea he patiently endured, while on reaching port he was again unhappily subjected to suffering little less in severity. When the *Queen of Commerce* reached Melbourne the precise nature of his injuries were ascertained. *The right femur, in addition to fracture of its shaft, had been dislocated into the sciatic notch, and Pott's fracture and dislocation of the left ankle sustained.* Let us for a moment reflect on the position of a patient in such a condition at sea, and far from surgical aid, and then contrast the termination of his case with the probable issue of one who had met similar injuries, but who enjoyed every assistance that eminent surgical skill could afford. It was deemed advisable by the medical men of Melbourne, to attempt, even after the lapse of three months, the reduction of the dislocation of the hip. Could it have been reduced when recent? For obvious reasons no interference could be made with Pott's fracture and dislocation of the left ankle. During the efforts made to dislodge the head of the right femur from the sacro-sciatic notch—a proceeding, I need scarcely remark, surrounded with difficulties when the dislocation is recent, not to speak of the late period at which it was then attempted—the femur snapped at the seat of the former fracture, thereby putting an end to all further endeavours at reduction, and consequently the head of the bone was suffered to remain in its new position. Being of a good constitution he again recovered without any bad symptoms.

From what I have related, the condition of this fine lad, the son of a clergyman, whose widow lives at present in Cork, can hardly be imagined. Buoyant with hope he left his mother and his home to seek support in a distant land; but ere the lapse of three days after sailing, all his expectations were for ever rudely blasted, and his life nearly forfeited. I reached Australia, having taken the voyage for the benefit of my own health, twelve months after he had met with these injuries, but was unaware of the fact until I received a request from his mother that I would find him out and ascertain the exact condition he was in. I accordingly did so, and my amazement may well be imagined, when I met him walking about the streets of Melbourne with the mere aid of a walking-stick in his hand. He walked lame, but not to the degree that may be expected in one whose right femur, in addition to having been twice fractured in the short space of four months, lay in the sacro-sciatic notch, and whose left ankle presented an unreduced Pott's fracture. His right leg was two inches and a-half shorter than the left, and the characteristic signs of dislocation of the head of the femur into the sciatic notch were present. The deformity of the left ankle was very great, and was evidently caused by dislocation of the tibia in addition to the fracture of the fibula. He occasionally felt great pain in the seat of the latter injury, and said it troubled him more than all the others, particularly if he walked much. The other symptoms he complained of were pain, referred to the new situation of the head of the right femur, which limb often became numb and dead, particularly if, when sitting, he crossed it on the corresponding one. He also experienced a "great catch" about the crest of the right ilium when he bent his body forwards. He often complained of a sense of fatigue and a disinclination to sit erect even to his meals. He could not well sit on an ordinary chair, but preferred a high seat, as bending the body distressed him. When he got off his seat, he was obliged to walk on the toes of the right foot for a little time before he could rest the sole on the ground. Flexion of the toes of the left foot was very limited.

I got him to stand on the right leg and rest the weight of his body on that

limb alone. This he did without inconvenience, thus showing the great accommodation afforded to the head of the femur in the sciatic notch. Finally, he experienced difficulty in the flexion of this leg, and when sitting had to keep it fully extended.

Little comment is needed on this distressing case, left, I may say, altogether to nature. It is true many unpleasant symptoms were often complained of; but, on carefully reviewing the foregoing history of this case, and remembering that but twelve months had barely elapsed since those injuries were sustained, one of which had been again renewed, I think few practical surgeons will refuse to join me in stamping W. B.'s recovery as one of the greatest triumphs of nature in the conservative cure of injuries.

With one question I will conclude this case. Unless by manipulation alone under the use of chloroform could the dislocation of the fractured femur, when the injury was recent, be otherwise reduced?—*Dublin Med. Press*, March 4, 1863.

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30. *Aneurism of Vertebral Artery.*—The *Gazeta de Lisboa* relates a case of aneurism of the vertebral artery which was mistaken for aneurism of the carotid. It occurred in the Lisbon Hospital San José. The tumour occupied the left side of the neck, reaching from the ear down to within four or five *centimètres* of the clavicle. It was soft, elastic, and pulsated feebly, the pulsation being diminished by pressure on the carotid. There was no *bruit* audible over it. It was first thought to be an abscess, and afterwards a carotid aneurism. The ligature of this artery was, therefore, practised; but the pulsations of the tumour were not stopped thereby. In the evening of the day of operation, the patient became agitated, and three days later paralysis of the left side of the face occurred, with violent pain in the arm, which was also paralyzed on the following day. The tumour was rapidly developed; dyspnœa, caused by pressure on the larynx, at last destroyed life about twenty days after the operation. The sac contained about 1000 *grammes* of blood, liquid and in clots, and communicated with the vertebral artery in its passage between the axis and the third vertebra.—*British Med. Journ.*, Feb. 21, 1863.

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31. *Mechanism of Dislocation of the Lower Jaw.*—M. Maisonneuve has succeeded in producing dislocation of the lower jaw on the dead body, by strongly depressing the chin, pushing the condyles forward by placing the fingers behind them, and suddenly raising the jaws by means of the index and middle fingers of each hand, placed behind and under the angle, so as to imitate the action of the masseters. This plan, he says, has never failed in more than thirty instances. On dissection, M. Maisonneuve has found that the condyles are carried in front of the transverse root of the zygomatic processes, and rest on their anterior face; that the coronoid processes, completely enveloped by the tendon of the temporal muscle, are depressed below the zygomatic arches, which they scarcely ever touch, and that they oppose no obstacle to bringing the jaws together; that the capsule of the joint is much stretched, but is not torn; that the external ligament, of which the normal direction is oblique from before backwards, becomes oblique from behind forwards, and is stretched, as are also the spheno-maxillary and stylo-maxillary ligaments; that the temporal muscle is elongated, but its tendon is not torn; and that the external pterygoid muscles and masseters are strongly stretched, but that the general direction of the action of their fibres is in front of the dislocated condyles, and not behind them. M. Maisonneuve found also that reduction was not facilitated by dividing the coronoid processes at their base, nor by dividing the zygomatic arches, nor by opening the capsule of the joint. On dividing merely the stylo-maxillary and spheno-maxillary ligaments, as well as the posterior fibres of the external ligament, the dislocation was reduced by the slightest pressure. He believes that the difficulty of reduction depends on the fixing of the condyle in front of the transverse root of the zygoma, by the passive resistance of the ligaments and the energetic contraction of the elevator muscle. He concludes hence that the best method of reduction is to gently depress the chin so as to relax the ligaments, and to push the condyles strongly back by means of the thumbs,

introduced into the mouth, and resting on the coronoid processes.—*Gaz. Méd. de Paris*, Nov. 8, 1862.

32. *Importance of Tapping Joints when distended with Fluid.*—Prof. INZANI, of Parma, in a paper on this subject, in *Omodei's Annali*, begins by asserting the perfect harmlessness of puncturing a distended joint, even during the progress of acute inflammation. The fear of bad consequences following from the wound of the tendinous structures is a mere imagination of the ancients; nor does the air ever appear to make its entrance. The puncture may be made with a trocar or a lancet; the latter is preferable for superficial joints. The author has operated very frequently on the knee, several times on the elbow, occasionally on the carpus and ankle, and once only on the hip; no bad consequences ever followed. Pressure by means of a starched bandage should be made, and when the synovial sac refills, it should be again punctured before the distension has advanced too far. In this way a radical cure may be obtained. Examples are given in which large joints, principally the knee, were open for effusions of blood, of serum in acute inflammation, of serum in chronic inflammation, and of pus—usually with a successful result. But paracentesis should be avoided where the skin is much thinned, and ulceration seems pending. In the synovial bursæ, paracentesis has given equally good results. The examples which are given are those of effusion in the sheaths of tendons after accident (as the peronei in sprains of the foot, the extensors of the thumb in falls of the hand), in which a puncture will give exit to synovial fluid mixed with blood, with much relief to the pain and abbreviation to the course of the disease. The author believes that by these punctures chronic synovitis may often be arrested in cases which, treated by ordinary methods, would end in "white swelling," and that in dropsy of the joint the treatment by repeated puncture and pressure is as effectual and more safe than by injections.—*Dublin Med. Press*, May, 27, 1863.

33. *Excision of the Knee-Joint.*—Mr. R. G. H. BUTCHER communicated to the Surgical Society of Ireland some interesting remarks on this operation, and related the case of a lad nineteen years of age, upon whom he had operated with success, making his fourth successful operation of this kind.

Mr. B. says: "It seems abundantly clear, from the facts collected by Dr. Hodges, as well as from the practice of Langenbeck, that gross carelessness and recklessness have been adopted in the selection of cases for the operation. What must we think of resection of the knee-joint performed for malignant disease of the patella, or what think of resection undertaken for acute abscess of the joint when pyæmia had already commenced? On resection performed on children, four years of age, who die of caries of the spine before the wound has had time to heal; notwithstanding, however great the authority or reputation of the surgeon that adopts such a line of practice, I deliberately state he is open to grave censure; he has mistaken altogether the nature and applicability of the operation, and has afforded examples of what ought to be avoided, and of a reckless style of operating, which tends greatly to retard the science, the art, and the progress of surgery.

"I never looked upon the operation of excision of the knee-joint but as a severe and terrible measure, not to be undertaken lightly or without grave consideration as to its applicability."

Mr. B. lays down the following directions to be adhered to in this operation:—

1. *The judicious selection of the case.*—The bones not being diseased far beyond their articular surfaces, while if upon section found to be a little more than had been expected, the part should be gouged out, or an additional thin slice removed; but if to a greater extent amputation should be at once resorted to, and as recorded in my first memoir with a hope of excellent success (*First Memoir on Excision of the Knee-Joint*, page 64). Again, the report goes on to show that amputation may be performed some days after excision should any unfortunate circumstance in the management of the case have arisen to demand

it. In this same paper seven instances are recorded of amputation of the thigh, and all made rapid recovery save one (page 65).

2. *The H incision should be preferred.*—The perpendicular strokes placed well back so as to allow all fluids and discharges to drain off; far more effective and safer than any opening made in the popliteal space. No portion of the flaps to be curtailed, though they may be thinned of any thickened fibrinous matter or diseased synovial membrane; the latter, particularly, should be clipped away with a strong scissors; all ligamentous fibres, both around and within the joint, should be cut through, and the extremities of the bones fairly freed and exposed.

3. *The patella should be taken away, in all cases, whether diseased or not,* and then the section of the bones well thrust out in front, should be made with "Butcher's saw," from behind forward, due attention being paid to the axis of the thigh bone at the time of its division.

4. *All bleeding vessels should be tied, or any that have sprung and retracted should be drawn out and secured,* so as to guard against intermediary hemorrhage.

5. *While the patient is yet on the operating table, the limb should be placed in the horizontal position, either by gentle and steady traction, combined with pressure of the cut surfaces of the bones backwards, or, if necessary, the division of the hamstring tendons.* Their support behind, in every case, I look upon as of great value; therefore, their section must be looked upon as a last expedient towards straightening the limb.

6. *During the adjustment of the bones, great caution should be exercised that their surfaces be throughout their extent in contact, and that no soft parts intervene.* The flaps should be then laid down and connected by suture closely throughout their transverse division, while the lateral incisions should be brought together only at their extremities by one or two points, and the central portion of each, that corresponding to the division of the bones, should not be brought in contact, but dressed lightly with lint soaked in oil, thus securing a ready outlet for the escape of fluids. The extremity should next be cautiously laid upon "Butcher's box splint," padded to the natural configuration of the limb, its sides elevated, foot-board applied, suitable pads introduced, and then the anterior splint laid on, taking the place of the assistant's hand, which from the first restrained the femur from projecting forward; then the straps buckled, the waist-band applied, and the patient may with safety be removed to his bed. The bed should be prepared in this way, and consist of a couple of hair matresses laid one upon the other, evenly supported, and intervening between the upper one and the sheet; a folded blanket, feather pillows for supporting the head and shoulders; the bed should be likewise moderately warmed so as to prevent the patient being chilled when put into it.

7. *The limb should not be disturbed for several days,* the length of time depending a good deal on the season of the year when the operation is performed, whether it be in the heat of summer or the cold of winter. After five or six days it may be necessary to let down the sides of the box-splint, to sap up discharge, change lateral pads, and soiled dressings, &c. By the apparatus named the facilities for cleansing the limb are so efficient that it may not be requisite to lift the member from its support for even so long a period as five weeks, as evidenced in my own practice. Should, however, it be considered expedient to change all the dressings, the anterior splint should be steadily held back by all assistants, and the limb pressed up to it, thus guarding against any starting of the femur forwards or displacement laterally when lifted from its bed. When the box is prepared freshly arranged, the limb, controlled after the manner mentioned, should be laid down, the side-splints elevated, foot-board secured, and the straps over the anterior splint first tightened, so as to maintain it in that position, from which it was never suffered to change. I would impress the advice still further, if the straps be unloosed for any purpose, *the hand of an assistant should steadily keep the anterior splint in its position* and well pressed back, until the artificial support is again brought to bear upon it and fastened.

8. *In cases where large abscesses form in the vicinity of the excised joint, or up along the thigh, Chassaignac's drainage tubes may be used with the best*

hopes of success. (See Butcher's Reports on Operative Surgery, *Dublin Quarterly Journal*, February, 1859.)

9. *The free administration of stimulants and sedatives, imperatively demanded in all cases of excision*, regulated to a certain extent by age, sex, temperament, and habit.—*Dublin Med. Press*, Feb. 11, 1863.

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34. *Malgaigne's Hooks for Fractured Patella.* By CAMPBELL DE MORGAN, Surgeon to Middlesex Hospital.—In a recent number of one of the Medical Journals, M. Malgaigne's hooks for the treatment of fractured patella are classed amongst the fracture apparatus which "may be regarded as models of what ought not to be used."

At the Middlesex Hospital, a large number of cases have been treated by the application of these hooks—perhaps, in no English hospital have they been more frequently used—and the results have been very satisfactory. My colleague, Mr. Henry, called attention to some cases under his care, in which a very close, and probably a bony, union had taken place under treatment by this apparatus.

The instrument consists of a pair of iron plates, each furnished at one end with two double sharp pointed hooks. One pair of these hooks is thrust through the skin, and is made to catch upon the upper edge of the bone; the other is similarly thrust in till it catches the lower edge. A screw bar then unites the two pieces; and by turning this the separated portions of bone can be readily brought into contact. When once fixed the hooks are allowed to remain until the parts have united; or until it may be thought desirable to replace them by a starched bandage.

Now, this sounds like a painful and somewhat savage proceeding, and one likely to be attended with danger; whether, in ordinary cases of fractured patella, and when cautiously applied, the hooks can give rise to mischievous consequences, I do not know. I have never seen the least indication of such results; and should not anticipate their occurrence. But as to the extremely small amount of pain which their application produces, and to its almost entire, and often entire, absence during the time they are worn, I can speak very positively; so far as the cases which I have seen or treated are concerned.

A case occurred not long since in the hospital, which illustrates this very satisfactorily. A woman slipped in coming down stairs, and fractured both patellæ. There was for three days a good deal of effusion into the joints. When this had subsided, I applied the hooks to the one side, leaving the other without any apparatus at all; both legs were raised in the usual position. Pain was, of course, produced, but only to a slight extent, while the hooks were being thrust through the skin. When I saw her the next day, she had not more pain on the one side than on the other; in fact, she had no pain on either side. The hooks remained on for more than a month without producing the least irritation or uneasiness. The broken portions of bone were pretty closely approximated on the side to which the hooks had been applied; on the opposite side, there was an average amount of separation—from half to three quarters of an inch.

Those who are conversant with the fact of the freedom from irritation which characterizes the presence of metallic sutures in the skin, would be prepared to expect a similar immunity from the presence of those hooks, if the parts be kept from motion.

I have a case now in the hospital which shows very markedly the simplicity of this plan of treatment, as well as the little tendency to irritation which it causes. A woman was brought in with a fractured patella. She was far advanced in pregnancy; and the house-surgeon judged very properly that she would be, in her condition, extremely discomforted if the limb were placed in the ordinary elevated position. He left her, therefore, till my visit. I found that there was only a moderate amount of swelling; and that the two fragments of bone were about an inch asunder. The hooks were at once applied, and the two pieces of the patella brought into contact. No splint or roller was used; nor was the limb elevated; she was simply enjoined to remain as quiet as she could. She has been lying perfectly comfortable, with no irritation around the hooks, and

no pain unless they be moved about. They have now been on for about a month; and the fracture seems to be nearly united.

There is one inconvenience which sometimes occurs, and which it requires a little management to overcome. The bones have a tendency to meet at an angle; so that while the two lower edges, for example, may be in contact with one another, the two upper edges may be separated by an eighth of an inch. I do not know whether practically there is any great harm in this; probably, the union is not so firm as it would be if the whole surfaces were in contact. The difficulty may generally be overcome by an alteration in the direction of the hooks, especially of the upper ones. They may be made to catch the bone in a different manner, without being altogether withdrawn; so that the pain of a second perforation of the skin is avoided. When once the proper position is obtained, and the screw adjusted, no further interference may be requisite until it is thought proper to remove the instrument.

So far from regarding these hooks as "models of what ought not to be used," my belief is that, if due caution be observed, there is no method of treatment which, with so little trouble to the surgeon, or irksomeness and pain to the patient, will produce such satisfactory results.—*British Medical Journal*, May 24, 1862.

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35. *Certain Errors in the Diagnosis and Treatment of Retention of Urine.*—Mr. Barnard Holt having lately met with several cases in which serious errors have been committed, both in the diagnosis and treatment of cases of retention of urine not *dependent upon stricture of the urethra*, has been induced to bring their salient points under notice of the profession. He relates five cases in which errors were committed, but as we suppose few surgeons of experience have not met with similar ones, we shall not transcribe them, but invite attention to some of his practical remarks, the importance of which we would like to impress upon our readers.

In all the cases related by Mr. Holt, the retention was due to paralysis of the bladder consequent on retention. "In fact," Mr. H. says, "the surgeons under whose care the cases first came were of that opinion, and attempted the introduction of catheters unsuccessfully, and then, putting the cases down as examples of 'suppression' were afterwards misled by the dribbling or overflow, which they took to be the re-secretion of the kidneys stimulated by the measures they had adopted.

"The diagnosis between retention and suppression is so very easy as to render a mistake perfectly inexcusable. In retention there is the urgent desire to micturate, accompanied with violent spasms, not only of the urethra and perineum, but of the whole abdominal wall; and as time elapses the *urgency increases*, the patient rolling in agony, and straining violently to relieve himself. Besides the surgeon's hand will at once detect the solid tumour above the pubes, formed by the distended bladder, which will yield a dull sound on percussion. In suppression of urine, on the contrary, there is no urgent desire to micturate, no spasm, and no agony consequent on a distended bladder; but the patient lies in a listless condition, soon passing into coma, whilst the breath and skin exhale a strong urinous smell. Moreover, the bladder will be found empty, and the fingers can be thrust into the pelvis, where the intestines yield a clear percussion sound. It must not be forgotten that a case of retention will at length pass into a typhoid condition, which might possibly be mistaken for the coma of uræmic poisoning; but the history of the case, and the presence of a distended bladder and dribbling of urine would at once point out its true nature.

"In all the cases I have seen, the error arises from the catheter's not having entered the bladder. Surgeons in general practice, who are not much in the habit of passing catheters usually introduce a gum-elastic catheter without a stilette, which, if it meets with even slight resistance, is very likely to bend upon itself, and thus never reach the bladder, although its whole length may have been introduced into the urethra. As I remarked in the early part of this paper, the injection of warm water at once clears up any doubt, and the fact that water cannot be injected may be considered conclusive evidence that the catheter has *not* reached the bladder.

"I have no hesitation in saying that in all cases such as I have described a catheter *can be passed* into the bladder, and I conceive it to be unjustifiable in any surgeon to be satisfied until he has withdrawn the urine; in which, if he will employ a metallic instrument of moderate size, he will in all probability succeed with ease. Time is of the greatest moment in these cases, and if, therefore, the surgeon in attendance do not succeed in his attempts, he is bound to call in assistance without delay, or his patient may possibly lose his life, or at least be condemned to the misery of the use of the catheter for the rest of his days.

"When the greater part of the urine has been withdrawn by the catheter, one of two courses must be pursued: either the instrument must be introduced every four or six hours or a gum-elastic catheter must be tied in, directions being given to the patient to empty the bladder at those intervals, with the view of keeping it nearly *empty*, so that the bladder may be able to recover its muscular tone and contractile power.

"The more I employ it, the more I feel satisfied with the use of turpentine, in ten or fifteen minim doses, in the cases complicated by hemorrhage from the bladder. In cases 3 and 4 it acted at once, although both gallic acid and the muriated tincture of iron had been employed without benefit; and I think the drug deserves a more general recognition by the profession."—*Lancet*, Feb. 21, 1863.

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36. *Incontinence of Urine.*—Mr. ROBERT JOHNS communicated to the Surgical Society of Ireland (April 10, 1863), the following cases of incontinence of urine, which are particularly interesting from the causes producing the affection, and from the novelty and success of the treatment:—

CASE 1.—Some years since a medical friend sought my assistance under the following circumstances: Mrs. B. sent for him, and stated that she should be obliged to get rid of her housemaid, whom she highly prized, unless he could cure her of an infirmity from which she had been suffering for upwards of a year, which was not only highly detrimental to her property, but most distressing to the girl herself. She was a strong, robust, healthy country girl, aged 25 years, of a plethoric habit, and was unable to retain her urine at night, which commenced to flow off involuntarily as soon as she became warm in bed, and continued to do so incessantly until she rose in the morning. My friend employed assiduously for two months every known treatment, but without the least benefit to his patient. He could not assign any cause for her malady, none of those laid down by writers having existed. However, on inquiring more particularly from herself, I discovered that about fourteen months previously she had had a bad fever, during which, on several occasions, her urine was retained, and on each was passed off by means of warm fomentations, but that the retention had eventuated in her then present complaint. I then recommended that a metallic catheter should be introduced each night into the bladder, and there retained for a quarter of an hour. At the expiration of a week from my visit, the doctor informed me that his patient was quite well, the catheterism having removed the incontinence, some benefit having resulted to her after the first introduction of the instrument.

CASE 2.—During the winter of 1861, Mrs. B., aged 30 years, of a strumous diathesis, called upon me, and stated that she could not retain her water for a minute, but that she was always worse at night, when she became warm in bed. She was the mother of one child (a male), which was still-born after a very tedious labour, requiring the use of destructive instruments for its completion. About the fourth day after the birth of her child her water began to pass off involuntarily, and had continued to do so for some years, but that about six months before her visit to me she had been cured of a very bad vesico-vaginal fistula (after six plastic operations) which had originated the incontinence. Having found on examination per vaginam and by the catheter, that the urethra and neck of the bladder were rough and highly irritable, every second day for three weeks I passed a metallic instrument into the bladder, and retained it there on each occasion for from ten to fifteen minutes, at the same time giving her each night a pill containing half a grain of extract of belladonna and four grains of

dried soda. Under this treatment her distressing complaint was removed, and at the termination of the period just stated she was able to retain her urine as well as ever she did at any time of her life.

Case 3.—On the 28th of December, 1862, I was brought some distance from town to see Miss M., a young lady, 13½ years old, who had only a few days returned from school, and had caught cold in travelling. I found the pulse quick, weak, and compressible; the tongue foul, covered with a whitish fur; the tonsils swollen, inflamed, and of a brick colour, with specks of diphtheritic exudation here and there on them, as well as on the soft palate. For a couple of days previously she had been complaining of chills and other feverish symptoms. At this visit she was also suffering very much from scalding and soreness of the genitals, consequent upon a dribbling away of her urine, which she had been unable to retain for a minute during the five preceding days. Her person and room were strongly impregnated with the urinous smell so common in such cases, and which obtained in the two former. Her throat was then well washed over with a strong solution of nitrate of silver, a gargle, consisting of dilute muriatic acid, chlorate of potash, honey of borax, and decoction of barley, was frequently used, the vapour of boiling water with vinegar was inhaled, and a mixture of infusion of bark, chlorate of potash, and tincture of the sesquichloride of iron was given every third hour, together with a liberal allowance of beef-tea and wine. For the soreness of the genitals fomentations of chamomile flowers with poppy-heads were employed, and followed by a lotion of subacetate of lead, at the same time strict attention to cleanliness being enjoined. Under this treatment the affection of the throat was removed, and the irritation at the vulva was lessened; but as the incontinence still persisted, the tonic mixture was continued, and cold bathing was ordered. On the 7th of January, as she exhibited some signs of incipient pertussis, from which her sisters and brothers were then suffering, she was ordered a stimulating imbrocation for the chest, and an expectorant mixture, with the addition of liquor potassæ and extract of belladonna, the former treatment having been suspended. After a few days she fancied the incontinence was somewhat less, yet, although the medicine was given more frequently, no real benefit accrued. On the 22d, as the pertussis was fully established, which increased very much the annoyance from the urinary complication, her mixture was changed for one consisting of tincture of cantharides, camphorated tincture of opium, syrup of bark, and syrup of orange-peel, but the liniment was repeated. On the 8th of February I was hurriedly summoned to see her, as she was suffering great pain in the genitals, which, on examination, I found to have been caused by an abscess in the right labia, which was at once opened with a lancet, and healed in a few days by linseed-meal poultices. Although the pertussis had been completely removed, yet, as the incontinence still obstinately remained, the bark and cantharides were given more frequently, and a blister was applied over the bladder, but without any better effect. On the 11th, having found that matters had not in any way improved, I passed a small-sized silver catheter into the bladder, and kept it there for ten minutes, when it, together with about an ounce of urine, was expelled with force into the bed-pan. On the following day she expressed herself as being much better; however, the catheter was again employed as before, and with the same happy results. On visiting her on the next day, she said she was quite well, and could retain her water for any length of time, and as well as she did at any period of her life, which salutary condition has continued up to the present. In the following way, according to her own statement, this distressing complaint originated: Having been at school about 100 miles from Dublin, she left for home for the Christmas vacation very early in the morning of the 23d of December, and did not arrive at her father's house until very late that evening, not having passed water during the entire day, although on several occasions having had a desire to do so; but as she was unaccompanied by a female friend, she was ignorant how to act, and after some time all the inclination to micturate passed off. On her arrival in Dublin she essayed to empty the bladder, but without success; yet, after several trials, she effected her object at the end of two hours. On the following day on rising she first became sensible of the incontinence, which had

been continuing during the night, and which persisted, as already stated, up to the 12th of February.

The points of interest in those cases to which I would direct attention are, the causes of the complaint, its persistent resistance to all medical treatment, and yet its having eventually yielded to so simple a surgical means.—*Dublin Med. Press*, April 29, 1863.

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37. *Successful Treatment of Severe Stricture of the Urethra by Gradual Distension at a Single Sitting.*—Mr. HENRY THOMPSON read a paper on this subject, and as there exists much diversity of sentiment in regard to the best mode of treating this affection, we give an abstract of the paper with a report of the discussion to which it gave rise, inasmuch as they present us with the views of the prominent London surgeons on this mooted question.

Mr. Thompson's object was to illustrate and explain a new method of treating severe or obstinate strictures of the urethra. This term is intended to denote those which are a little benefited by dilatation. The distinction which constitutes its novelty does not consist in the mere production of some alteration or improvement in existing mechanical contrivances, but in the adoption of a mode of action on the stricture itself, which is different from those which characterize any of the other systems of treatment pursued at the present day. The author shows in what it differs from dilatation, simple and continuous; from rupture, or "instantaneous treatment;" from cauterization; and from incisions. He illustrates the proceeding, which he distinguishes by the term "gradual distension," and describes the instrument employed to accomplish it. By the process in question, the strictured part of the urethra only is acted upon, and this not to a degree short of, but up to or even beyond the natural calibre of the canal, wherever the stricture may be situated. All this is accomplished at one sitting, but with gentleness and slowness, so as to avoid unnecessary rupture; the degree of distension being regulated with absolute certainty, and its extent indicated with extreme accuracy, by apparatus in the handle of the instrument employed. The object of the operator is not to rupture, but to over-distend the fibrous tissue which constitutes the stricture, so as to destroy, or at all events, to impair, its natural tendency to contract. He aims at attaining that result which occurs from the practice of over-distending vital tissues elsewhere,—viz., to impair or destroy their contractility. This is known to happen after the application of over-distension to both healthy and morbid tissues, and is turned to account by the surgeon for that purpose. The class of patients for which this proceeding appears to be best adapted is described, and illustrative cases are appended. The instrument consists of two long and narrow steel rods, accurately applied throughout their entire length by the single plane surface which each possesses. The external surface of each rod is convex, so that together they form a nearly cylindrical instrument, but tapering towards the lower extremity, where they are closely united. At the opposite or upper end they are also united, and are surmounted by a handle resembling that of an ordinary sound. This handle is attached to a screw with a very fine thread, which being turned causes the two rods to diverge very slowly and very gradually from each other at a given spot, about six inches from the handle. When the separation of the blades is effected, an index placed near the upper end, and connected with some numerals on a disk, shows the exact degree of extension made by pointing out that number of the catheter scale to which the distension existing at that moment is equivalent. The general form and contour of the instrument is that of a slightly curved catheter. When the screw handle is turned, the two rods separate, so as to form a long oval or spindle-shaped figure, the long diameter being about three inches and a half or four inches in length, and the short diameter corresponding to the number of turns given to the screw and varying between the slightest possible separation of the rods and an interval of about three-eighths of an inch, or even more. The stem of the instrument has marked on it a graduation in inches, which commences one-quarter of an inch below the point of maximum distension or centre of the spindle-shaped figure produced by the separated rods. It is that point which will correspond with the stricture when the instrument is placed in the urethra, so that the con-

tracted portion of the canal undergoes the greatest amount of distension which it can be desired to produce, while the rest remains wholly unaffected. The mode of applying the instrument is as follows: A medium or full sized bougie or catheter is first passed as far as to the stricture, and the distance from it in inches to the external meatus carefully noted. Suppose it to be five inches, the operator, taking the distending instrument, places the little blue steel collar which slides on its shaft opposite to the figure 5, and passes the instrument through the stricture until the collar arrives at the meatus of the urethra, and prevents the instrument from entering further. The maximum point of distending power must therefore correspond with the narrowest part of the stricture. The act of distension is now commenced by making two or three turns of the screw-handle, and is continued by slowly turning it once every half minute, taking care at the same time to prevent the instrument from shifting its position, by observing that the collar remains opposite the external meatus. In a short time the index, gradually rising, shows that the calibre is reaching Nos. 10, 11, 12, and so on, until in a few minutes No. 14 or 16 has been reached, which latter limit is usually quite sufficient. The screw-handle is now slowly turned backwards, not the whole way, but until the index has retreated to about No. 8 or 9 when the instrument is withdrawn. The operator next passes a full-sized gum-catheter into the bladder, and fastens it there, leaving it in place for about twenty-four hours. It is then removed altogether. All that remains to be done is to pass a full-sized metallic instrument every second day for a week, and after that at increasing intervals for a week or two longer.

Mr. Holt said that his mode of operating having been alluded to by Mr. Thompson, he was desirous of offering a few remarks upon the plan which that gentleman had proposed to the society, as contrasted with that which he (Mr. Holt) had adopted for some years. Mr. Thompson's instrument differed materially from his, both in the method of its application and its capability of enlarging the strictured portion of the urethra, and he claimed for his instrument the power of dilating the stricture to No. 14 or 16, while the meatus is not interfered with. For its application, however, it was necessary a gum-elastic catheter should be retained in the urethra for two or three days. It was then removed, and the seat of the stricture accurately ascertained by passing a large bougie. This is to be marked, and such measurement is to regulate the distance which his dilator should be introduced. The patient being now placed under the influence of chloroform, the dilator was passed, and the handle slowly and gradually turned, so that dilatation could be effected to any extent, the whole operation occupying from ten to twenty minutes, according to the character of the obstruction. The dilator was now removed, and a No. 12 gum-elastic catheter substituted, and retained in the bladder for two or three days, according to circumstances. A No. 12 bougie was afterwards passed at intervals of a day, and so the after-treatment was continued as in any other plan. Now, his (Mr. Holt's) first objection to this method of treatment applied to a difficulty which might arise in the hands of a surgeon less accustomed to the passing of bougies than the author of the paper. The penis during an examination alternates in its length, and is at one moment quiescent and at another semi-erect. When this occurred, it would so alter the relative measurements as to render them of little value; and this part of the treatment was of great practical importance, inasmuch as it was necessary that the centre of the dilating power should exactly correspond to the centre of the stricture, and without it the dilatation would be either in front or behind the obstruction, and so be perfectly ineffective. His next objection would apply to instances in which there was more than one obstruction; for in his experience there were frequently two, and sometimes three or even four obstacles to be overcome, and in these instances it would be necessary to materially prolong the operation, or repeat it upon three or four separate occasions. Mr. Thompson laid particular stress upon his capability of dilating the stricture to No. 14 or 16 or more, when the meatus will only admit a No. 12. In the first place, he (Mr. Holt) believed the author was in error in supposing that a dense obstruction would allow itself to be dilated to the size he mentioned; it must be ruptured, as was shown by the occurrence of hemorrhage. But even granting that it was so, he (Mr. Holt) could not see the least advantage

that could arise from dilating a stricture beyond that which could be maintained by the after-passage of a bougie. The part which was so dilated quickly contracted, otherwise there would not be any necessity for the after-passing of the bougie; but as this was necessary, and the bougie could only represent the size of the meatus, no advantage could accrue from distending the stricture beyond its natural limit. If any further proof were required that this was so, he might refer to the median operation of lithotomy, which he had frequently performed, and removed, without cutting the neck of the bladder and prostatic portion of the urethra, calculi varying from an inch to an inch and a quarter, the parts being dilated by the introduction of the finger, the subsequent passage of the forceps, and the extraction of the stone. In all these cases the patient had retained the power of expelling the urine at will, which specially showed how speedily any undue dilatation of the urethra contracts again. His (Mr. Holt's) third objection would apply to the necessity of retaining a catheter in the bladder both before and after the operation had been performed. In many instances the patients were quite incapable of bearing the retention of a catheter, from the pain and irritative fever it produced, and it confined them to the house or bed for an unnecessary period of time. Mr. Holt then related a remarkable case of irritable and intractable stricture, in which, after all the usual means employed for a long period had failed in the hands of an experienced surgeon, he had, in a few minutes, split up the stricture with his instrument, and the patient recovered without a bad symptom, and remained well to this time—a period of twelve months. Were he not afraid of occupying too much of the society's time, he could relate several most interesting cases to prove that he had not made any selection for the purpose of enhancing the success of his operation; but that, on the contrary, he had operated upon the most severe and complicated examples that could be submitted to the surgeon. Two other cases he would briefly allude to. One was that of a gentleman from Liverpool, who consulted him for incontinence of urine, from which he had been suffering for two years, during which he was compelled to wear a urinal, and his health was so damaged that he was recommended to go to Madeira for a change. Upon inquiry, Mr. Holt was satisfied that the bladder was full, and, having gained the patient's consent to introduce a catheter, he, with great difficulty, passed a half No. 1, and removed three pints of most offensive purulent urine. His bladder was paralyzed, and there was every probability, from the length of time it had been distended, that the ureters and the pelves of his kidneys were abnormally enlarged. For the purpose of keeping the bladder empty, the catheter was introduced three times during each of the first two days, and upon the third he passed the dilator and split the strictures, so that the urethra would admit a No. 10 catheter. In one month this gentleman returned to Liverpool, with his health almost entirely re-established, passing urine with the greatest facility, and the urethra admitting a No. 10 easily. During the last month, Mr. Cutler asked his (Mr. Holt's) opinion upon the case of a gentleman who had been operated upon by Mr. Syme. The patient had subsequently been subjected to internal division, and a second time Mr. Syme's operation was performed by Mr. Bickersteth, of Liverpool. When he consulted Mr. Cutler, he was obliged to pass the catheter five or six times in the twenty-four hours, and he was entirely prevented, by the escape of urine during the intermediate periods, from entering into society. Mr. Holt, having explained to him that in such a case he could not positively affirm what the result might be, consented to split the obstructions; but the patient, being exceedingly nervous from the recurrence of rigors after every attempt to enlarge the urethra, would not consent to the operation without the aid of chloroform. The dilator having been passed, it required all the force Mr. Holt could make use of, even with a towel placed over the large extremity of the tube, before the stricture could be split. Upon the dilator being removed, a No. 10 catheter was passed, and the bladder emptied. This gentleman never had a bad symptom of any kind or description; he never even went to bed, and in two days was able to visit some friends in the country. He declared that he could now pass urine better than he ever remembered; and in a fortnight he returned to Jersey, being capable of introducing an instrument himself without the least difficulty or pain. Mr. Holt

stated that he had now operated, in hospital and private practice, upon more than 250 cases, without any complication of either infiltration of urine, abscess, swelled testes, or inconvenience of any kind, further than the occasional supervention of a rigor or mild attack of stricture fever. He must therefore still retain his opinion in favour of his instrument, which had now been tested to the utmost. It was perfectly simple, and capable of being used by any surgeon who was able to pass a catheter. The operation did not require either the previous or after retention of a catheter in the bladder; it was completed in one second, however many obstructions there might be; it did not, excepting in very severe cases, require the administration of chloroform, and the patients were not confined to the house longer than the afternoon in which the operation was performed; the pain was of the most trifling description, and the danger *nil*. He would only detain the society another minute in describing the improvement he had lately made in the dilator, and which had been only completed that day. The objections raised to it by some surgeons were, that in its present state you had no positive evidence when you were in the bladder, and that the tube might possibly slip from between the blades. He had now so improved upon this that it was quite impossible the tube could so escape, and the dilator acting as a catheter permitted the flow of urine. He had no hesitation in declaring that, as now manufactured by Messrs. Whicker and Blaise, of St. James's Street, the dilator was as perfect as any instrument could possibly be.

Mr. Solly was pleased at any proceeding which showed the advantage of dilatation over cutting in the treatment of stricture. He contended that if an instrument could once be passed into the bladder, cutting was unnecessary. There might be cases in which it would be impossible to succeed in such an effort, and then incision might become requisite. He had never had recourse to the plans recommended by Mr. Thompson and Mr. Holt, but had been in the habit of adopting a modification of Mr. Wakley's plan, previously resorted to by Hutton, of Dublin. He used a catgut bougie instead of the metallic guide, and elastic catheters instead of the silver ones. He had used this plan of gradually dilating the urethra with much success. In hospital patients he allowed the catheter to remain in the bladder for some time, but not more than half an hour in private practice.

Mr. Fergusson said it had been proved that dilatation of the urethra might be effected, even to the extent of a No. 12, 14, or 16 catheter in a few minutes, without risk, and effectually. The mode now adopted for this purpose differed entirely from what was called "forcing down a stricture" by the introduction of a full sized catheter. This was not unattended with danger; for it was not always possible to tell where the point of the instrument would go, or to what extent the urethra might be damaged. By the mode employed by either Mr. Thompson or Mr. Holt, no such risk was incurred. He (Mr. Fergusson) thought the plan mentioned by Mr. Solly would not be found so effective as when the silver instruments were used. With regard to Mr. Thompson's instrument exhibited that evening, he questioned if it were strong enough to break up the stricture without breaking the instrument in some of the more severe cases. This could not occur when Mr. Holt's plan was resorted to; however great the force applied, the instrument could not give way. So much force was occasionally required, that he (Mr. Fergusson) should be fearful of trusting to Mr. Thompson's instrument. This instrument, as far as the plan of treatment itself was concerned, did not differ much from that of Mr. Holt. The plan of immediate dilatation would do much towards dispensing with internal and external urethrotomy.

Mr. Acton was glad to hear that the advocates of the various plans for treating severe forms of stricture had not found cause for disparaging that by internal incision, a treatment he had found most successful. It was admitted on all hands that dilatation, consistently persevered in, was alone sufficient to remedy the greater portion of strictures. In hospital practice (in order to save the time of the poor) it might be necessary to resort at once to other plans; but, among the upper classes, where a rapid cure was not of such importance, the patient usually objected to have his stricture split, or any other similar heroic remedy employed, and which he (Mr. Acton) was glad to hear was unattended with any

danger. The Fellows of the Society must, however, recollect—and the shelves of the surrounding library would support the statement—that the advocates of every novel treatment of stricture had ever lavished the same praises on their different systems as had been listened to that evening. Time could alone test the value of the rival schemes; but he was not inclined to think that any one system would be found applicable to all cases. It had been stated in the course of the discussion, that within a short period, and in the practice of one surgeon, 250 cases of stricture had been split. Now, seeing the comparative rarity of cases requiring such treatment, we must believe that many strictures had been split which would have been treated (by other surgeons) by more simple means. The author of the paper had spoken of the success of his treatment depending "upon over-distension of the fibrous tissue, so as to destroy, or at all events impair, its natural tendency to contract." He (Mr. Acton) was yet to be convinced that over-distension at one sitting would accomplish this very desirable end; for the more he treated stricture, and the more he studied the structure which composed the India-rubber-like mass we had to distend, the less disposed was he to believe in a rapid cure, or that a healthy structure would at once displace this elastic tissue. Stress had been laid during the discussion by more than one speaker on the advantages of his or their operation as succeeding after others had been tried and failed. Mr. Acton would appeal to the practical Fellows of the Society if cases were not brought under their notice of patients who had been condemned to these heroic operations, and who before submitting to them applied for a second opinion, and who were cured by dilatation alone, showing that the operation that had been recommended was at least unnecessary. When dilatation was unable to effect a cure, internal incision came in most opportunely, and the division of the elastic tissue by the knife enabled the surgeon to pass his instrument, and cure the stricture. This, he maintained, was the more scientific treatment, and more in accordance with all the theoretical and practical principles of surgery, and one which had been gradually gaining ground since the instruments employed had been perfected.

Mr. HULKE had employed Mr. Holt's plan in thirty cases, many of which were out-patients at the hospital. He had never seen any untoward result, though the patients went about as usual. He did not regard it as a serious operation.

The PRESIDENT had in many cases followed Mr. Holt's plan of proceeding. He had never seen any but good results from it.

Mr. THOMPSON replied *seriatim* to objections raised by Mr. Holt. First, that there was no difficulty in measuring the distance at which a stricture was situated from the meatus in order to adjust his instrument, and that no man who found that a difficulty was competent to use an instrument in the urethra at all. It was, indeed, an ill compliment to surgeons to imagine want of ability to accomplish so easy a matter. Secondly, that it was not often necessary to apply the instrument for two strictures in the same urethra, but if there were two, no difficulty in applying it twice existed. Thirdly, that although it had been his practice to tie in a gum catheter twenty-four hours afterwards, he did not regard it as necessary; he had done so as a precaution, and if any objection to this existed, it would be as safe to dispense with it here as after Mr. Holt's operation. From the remark, that there was no advantage in distending to No. 16, if the bougies subsequently passed could not exceed No. 12, he differed very widely. It had long been admitted to be a desideratum to find some means of dilating the stricture to the size of the canal where it is situated, and it is notorious that the bulbous portion, where stricture most commonly exists, is little more than half dilated by a bougie which fills the external meatus. The subsequent dilatation by such a bougie sufficed, but if thought necessary it might be maintained by the distending instrument itself which formed an excellent dilator. He had a patient at this moment who preferred it to a bougie for ordinary use. Again, it had been assumed on theoretical grounds that its power was deficient. He could only say that in practice the instrument had resisted very severe tests, and was amply strong enough for its purpose; but he would say again, as he had said in the paper, that where the induration surrounding the urethra was very considerable, involving, possibly, the substance of the corpus spongiosum throughout, especially when anterior to the scrotum, incision was more likely to

be permanent in its effects than either his own or Mr. Holt's method. He agreed with Mr. Acton that this was highly useful in some cases. An important distinction existed between forcible catheterism and distension, which had been well drawn by Mr. Ferguson; the dangers of that now happily exploded method resulted from tearing away the stricture from its connections, and driving it down the urethra. Simple expansion from within outwards, provided it was thoroughly efficient, had now been proved to be unattended with danger. Finally, it was most satisfactory to him to hear from Mr. Holt and others the success which had attended his operation, because in some particulars it was closely allied to his own proceeding; thus, he contended that Mr. Holt's operation might be perfectly performed with his (Mr. Thompson's) instrument, but that the latter possessed in addition these two advantages—first, power to carry the distension to a much higher point; and, secondly, that it could be done gradually and slowly, so as to over-distend the tissues as much, and rupture them as little as possible. It was on these two grounds of difference that he claimed for this proceeding an examination and a trial, since he conceived them to constitute an improvement of no mean value.—*Med. Times and Gaz.*, May 2, 1863.

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38. *Observations on Ovariotomy, etc., Statistical and Practical; also, a Successful Case of Extirpation of both Uterus and Ovaries.*—Dr. Clay gave to the Obstetrical Society of London (March 4, 1863) a brief and interesting outline of his experience on this very important branch of surgery. Of 109 peritoneal sections, of which 104 were for ovarian extirpation, 3 for cutting down upon the tumour to establish ulceration where its removal was known to be impracticable, 1 for the Cæsarean operation, and one for the removal of both uterus and ovaries. Of the 104 ovarian cases, 72 recovered, 32 died; all the 3 ulcerative cases recovered; the Cæsarean section lived to the fifteenth day; and, lastly, the case of entire removal of both uterus and ovaries recovered. Of the 32 deaths, 10 died from the immediate consequences of the operation, 10 from inflammation, 10 from prostration, and 2 from hemorrhage. The great majority of the first and second series were young females, as well as a portion of the third division. Those from prostration were chiefly elderly females. Some other statistical facts were elicited, as well as the following remarks from the author: Dr. Clay still defends the raised temperature of the room for operation, and attributes much of his success to its influence; is not certain if chloroform has added anything to the successful results, although he values it highly as an agent which it would now be difficult to lay aside, although the first fourteen of his cases were performed before it was discovered, and of which nine recovered; and he still thinks, if a woman could face the difficulty without it, it would be in her favour. The large incision is still practised by him, and deemed far preferable to the smaller opening. Of course, the author wished to be understood that the incision was to be commensurate with the tumour to be extirpated. Dr. Clay gave many reasons for this preference. The distressing vomiting he conceived to be in a great measure owing to the use of chloroform, as he saw but little of it in the first fourteen cases where it was not used. For this troublesome symptom he advises patience until the blood has got rid of its load of carbon, the simplest of drinks, and as little food as possible. Some very well-ascertained facts of critical days were adduced, which would require too much space to dwell upon; suffice it to say, the third, sixth, and ninth were the principal, and the causes of each were pointed out. No particular age seems to be prominent in respect to the success of these cases. Dr. Clay himself stated them to be about equally successful at all ages from sixteen to fifty-seven. Purgatives are not admissible; and he relies on enemas, with ox-gall, etc. This part of the paper was concluded by some interesting remarks on ovariotomy for the last twenty years, and the difficulties the author had to encounter, not the least of which was misrepresentation. The author next gave in detail a new and interesting operation, which he believed to be the first of its kind, successful at least, in this country—namely, the entire extirpation of the uterus and its ovaries through the abdominal walls, which has ended most fortunately, the lady returning to her friends on the thirty-fifth day after the operation, and still continuing well, thus establishing another great fact in reference to abdo-

minal surgery. The case was that of a fibroid uterus of eleven pounds weight, with the ovaries in an unhealthy condition; and the tumour by its growth had latterly so entirely filled up the cavity of the pelvis as to render the passage of the feces and urine extremely difficult. The particulars of the case throughout its progress were given. Dr. Clay does not suppose that many uterine cases could be advisedly extirpated, but thinks some of those densely-hard fibroid masses, where the constitution has not been greatly prostrated, might afford a fair prospect of cure under the knife.

Mr. SPENCER WELLS said that he must not be supposed to undervalue the very useful paper of Dr. Clay, or to be ungrateful for the lessons which he had taught us all by his able advocacy of ovariotomy, if he (Mr. Wells) ventured to discuss two very important steps of the operation in which his own practice, and the practice in London generally, differed from that of Dr. Clay. Dr. Clay still advocated the long incision; and he still left the tied end of the peduncle and the ligature within the peritoneal cavity. He could boast of a success attending this practice of 70 per cent. of recoveries to operations, and as success was the best criterion in surgery, it might seem presumptuous to question the wisdom of any operative proceeding practised so successfully. But his (Mr. Wells') own experience had led him so decidedly to prefer the short to the long incision, and to keep the tied end of the pedicle outside rather than to leave it in, that he could not help suspecting that Dr. Clay's great experience in the operation had led him to success in spite of a method which more recent experience had modified or corrected, and which men of less experience could not follow without great danger of failure. After long incisions there was so much more exposure or escape of intestine during the operation, so many more serious symptoms after it, and so comparatively protracted a recovery, even in successful cases, that his (Mr. Wells') own experience had taught him to avoid any greater length of incision than was necessary for the exposure and removal of the cyst or tumour. Every inch in the length of incision appeared to add something to the chances against the patient, and in cases where he had the choice either of making a long incision and removing a tumour entire, or of breaking up a tumour and removing it through a small opening—even though ovarian fluid might unavoidably escape into the peritoneal cavity and require careful sponging for its removal—he would prefer this alternative rather than make a very long incision. So, in his experience, those patients in whom it had been necessary to leave the pedicle and ligature within the peritoneal cavity had suffered so much more after the operation, and their recovery had been so much more protracted than others where the peduncle had been kept outside, that he would always prefer to keep it out if he could, and so avoid the danger of absorption of the putrid matter of the strangulated stump, or the peritonitis connected with the effusion of fibrin thrown out to circumscribe the stump and ligature. It seemed probable that the frequent occurrence of peritonitis in Dr. Clay's practice was in some measure due to his manner of treating the pedicle; for in his (Mr. Wells') own practice, peritonitis was a rare accident. Of eighteen fatal cases, it had only had any important share in the fatal result in two; in all the others, shock or exhaustion after the operation, or blood-poisoning, having been the cause of death; while in successful cases he hardly remembered peritonitis in any patient where the pedicle had been kept out. As to the temperature of the room, in his earlier cases he had followed Dr. Clay's practice; but latterly he had found it better simply to have the room kept comfortably—not excessively—warm, and after the patient was in bed to keep a good fire burning and a window open night and day. In the use of opium also he had learnt to avoid all excess. If there was pain or restlessness, it was given in moderate doses, and repeated if necessary; but some patients had recovered without taking a single dose, and others with not more than two or three doses. Sometimes it was given to secure a good night, even if there was no pain. With regard to the removal of uterine tumour by abdominal incision, it was only under the most exceptional circumstances—where the life of the patient was in great danger from hemorrhage or the effects of pressure—that such an operation as that so successfully performed by Dr. Clay could be justifiable. Pedunculated peritoneal outgrowths from the uterus might be removed

with moderate risk, and so might ingrowths towards the uterine cavity or vagina; but any attempt to enucleate interstitial fibrous tumours of the uterus, either by incision through the abdominal wall, or by incising the cervix *per vaginam*, was attended by such very great risk that nothing but the most urgent necessity would justify the practice. He (Mr. Wells) said this rather as the result of his own observation, than as any conclusion suggested by Dr. Clay's successful case.—*Med. Times and Gaz.*, April 18th, 1863.

39. *Vesico-vaginal Fistula.*—Dr. I. Baker Brown read (Feb. 4, 1863), before the Obstetrical Society of London, an interesting paper on vesico-vaginal fistula, the mode of operating, and the results obtained in fifty-five cases at the London Surgical Home. In the first part of the paper the author gave an account of the method at present followed by him in operating. The various steps of the same were illustrated by drawings. No bars or clamps are used. The knives employed are two—one for the right hand, and one for the left. The needles, of various curves, forming a series fourteen in number, are on the same principle as Startin's, but of rigid material. They are armed with wire, and thrust through the pared edges, great care being taken to avoid the mucous coat of the bladder. The two ends of the wire are simply twisted round and round, and so fastened. The patient is afterwards laid on the side, and a male elastic catheter, with bag attached, kept in the bladder. She is kept quiet ten or fourteen days, and the wires removed. The operation is often completed in ten minutes. The total number of cases of vesico-vaginal fistula admitted into the London Surgical Home since its foundation, four years and a half ago, is 58. Of that number, 55 were submitted to operation, with the results as shown in an accompanying table. The remaining 3 were not operated upon in consequence of the bad condition of bodily health, the result of syphilis. Of the 55 cases treated, 53 were operated upon by the author, 1 by Mr. Nunn, and 1 by Mr. Harper. Of the total number of operations, 43 were followed by perfect cure, 1 was much relieved, 2 died, 5 were not cured, and 4 are still under treatment, with every prospect of cure. Of the 43 cures, in 24 this result followed the first operation, including the cases of Mr. Nunn and Mr. Harper; in 8 the cure occurred after the second operation; in 5 after three operations; and in 6 after more than three operations. Of the other cases which were not cures details were given in tables exhibited. Of the two fatal cases, 1 died eighteen days after the operation, apparently from exhaustion, the age of the patient being 56; the other died seven days after from pyæmia. With regard to the causes of vesico-vaginal fistula. Of the 58 cases admitted into the London Surgical Home, 47 were over twenty-four hours in labour, and 39 were as much as thirty-six hours or more; 7 were two days, 16 were three days, 3 were four days, 2 were five days, 2 six days, and 1 seven days. In the whole number of cases, instruments were used in 29, exactly one-half; and in 4 only of these was the labour less than twenty-four hours, and with 7 exceptions the patients had been thirty-six hours, or more in labour before instruments were used. Of the 58 cases, in 24 only the injury happened at the first labour, in 7 at the second, in 5 at the third, in 4 at the fourth, in 6 at the fifth, in 2 at the sixth, in 5 at the eighth, in 1 at the ninth, in 1 at the thirteenth, in 1 at the fifteenth, and 2 not mentioned. In many of these cases, notwithstanding the existence of the fistula, the patient bore several children, apparently without inconvenience, before coming under treatment; and in a few of them, subsequent to cure by operation, other children have been born without recurrence of mischief. In a large proportion of the cases there is a history of the birth of a very large child; in some it weighed 15 lbs.; and in one, that of the woman in whom the lesion happened at the fifteenth labour, the child weighed 17 lbs. From the foregoing statistics it is evident that the cause of the lesion is protracted labour, and not the use of instruments or deformity of the pelvis; and, as a necessary conclusion to what has been stated, it follows that vesico-vaginal fistula would scarcely or never occur if a labour were not allowed to become protracted: that is a point for the careful consideration of the society and of practitioners at large. A printed tabulated statement as to the 55 cases operated on was handed round. Mr. Brown further stated that he had had 11 other cases under his care at St. Mary's Hos-

pital, and 6 in private practice, making a total in his own experience of 58 cured; 34 by one operation, 11 by two operations, 5 by three, and 8 by more.

Mr. Brown said in America, Drs. Sims and Bozeman did nearly all the denuding of the edges with scissors. This made the operation very long. But if the knife were first used to mark around the fistula how much was to be taken off, and then, by means of a fine pair of forceps, the edges were made tense, Mr. Brown said that the whole fistula might be denuded, taking out a complete ring—a matter of great importance. In regard to the sutures, Mr. Brown stated that he greatly preferred wire, although Dr. Hayward, of Boston, United States, used silk in preference. Mr. Brown had by this gentleman's advice used silk in one case with a good result. But they were more liable to slough, and the wires, from their stiffness, had the advantage of keeping the edges more in apposition, and so insuring a greater depth of union. But the sutures to be used should, Mr. Brown thought, be silver, not iron, as recommended by Dr. Simpson, of Edinburgh. Mr. Brown expressed a very strong opinion in favour of keeping the sutures in long enough; never less than nine days. He believed no harm ever resulted from retaining them in longer; but in one case he had had, he removed them on the sixth day, at the patient's request. The fistula appeared quite healed. She got up next day, contrary to advice, and the whole burst open again. She was reoperated on; the sutures were left in a sufficient time, and a cure resulted. Mr. Brown had made experiments, and kept silver sutures in for six and nine months, and no trace of ulceration appeared. Mr. Brown considered that opium should be given only in sufficient quantities to keep the bowels quiet. One grain immediately after the operation, and repeated night and morning, according to the circumstances of the case. Many patients cannot bear the catheter, especially the leaden one, but Mr. Brown had seldom found the male elastic catheter to cause irritation. Perhaps in time we might gain sufficient confidence in the operation to allow the patient to pass her urine as required, but at present it was better to retain a catheter, or, when that was not tolerated, to pass one when needful. He had purposely used the term protracted without reference to the cause of protraction, for it was very rarely that a medical statement could be obtained. It was necessary therefore to take only the statement of the patient as to the duration of labour. When the head was impacted, Mr. Brown would deliver as soon as possible by forceps. He quite agreed with Dr. Tyler Smith as to the necessity of maintaining the integrity of the other parts in these operations. Of the two cases on which he (Mr. Brown) had operated, and where the patients subsequently menstruated per urethram, in one, the patient having been under many operations in other hands for some years, the os had already been interferred with either by sloughing or by the operation, and only one small opening, as described, remained to be closed. There was therefore nothing left to do but to close the opening, regardless of the menstrual flow. The patient had done well. No inconvenience had arisen, and she was grateful for the benefit received. In the other, that lately brought before the society by Mr. Chapman, the os uteri was already closed by cicatrization, after extensive sloughing, and therefore Mr. Brown had nothing to do with its occlusion. He considered that the two terms, vesico-vaginal and vesico-uterine fistula, were not used with sufficient caution. Although the os uteri might often be involved in vesico-vaginal fistula, the true vesico-uterine fistula was when the hole was high up in the cervix, urine dribbling through the os uteri, although no aperture from the bladder was visible. This was the kind of which Jobert had related seven cases, Dr. Fleetwood Churchill one, and which had lately been so well described by Mr. James Lane, who had had one case. In all these the treatment had been to close the os, so that the patient menstruated per urethram. He (Mr. Brown) had never had such a case, but he thought that the treatment adopted was decidedly the lesser evil, and if the patient, on having the case laid before her, was of the same opinion, he considered it perfectly justifiable. The case Mr. Nunn had mentioned showed that, by leaving a vesico-vaginal fistula alone, other evil results, besides the inconvenience, would arise.—*Med. Times and Gaz.*, April 4, 1863.

OPHTHALMOLOGY.

40. *Cerebro-Spinal Origin and Diagnosis of the Protrusion of the Eyeballs termed Anæmic.*—The *Edinburgh Medical and Surgical Journal* for February last contains an extremely interesting paper by Prof. Laycock on a disease characterized by general debility resembling anæmia, considerable and varied nervous disorder, greatly increased activity of the heart and of the arteries of the head and neck, a vascular enlargement of the thyroid gland resembling bronchocele, and staring eyes, with protrusion of the eyeballs, giving a peculiar expression to the face. This affection has, within a few years, attracted much attention, and its pathology has given rise to much discussion, though the opinion put forth by Dr. Begbie, of Edinburgh, that it was caused by anæmia has been most generally accepted.

Prof. Laycock combats this opinion, and maintains with great plausibility that the affection results from disorder of the nervous system. He shows that the symptoms and signs which are relied upon as diagnostic of anæmia are of questionable value, and that they may all be the result of disorder of the nervous system.

The views of Prof. L. are founded on the brilliant physiological researches into the functions of the nervous system, conducted by Stilling, Claude Bernard, Schiff, Budge and Waller, Brown-Séquard, and others, and they seem to us of so much practical value that we shall give a full exposition of them.

"A very distinguished anatomist and physiologist in his day, Pourfour du Petit," says Prof. L., "was the first, in 1727, to show the influence of injury of the cervical portion of the sympathetic system on the eye.[1] He observed contraction of the pupil, retraction of the globe, and redness of the conjunctiva, to result. These observations were confirmed by numerous subsequent experimenters; but, in 1845, M. Biffi, of Milan, added the important fact that when the iris was contracted in consequence of division of the cervical sympathetic, it became dilated if the upper end of the nerve was galvanized. In 1852, Professor Claude Bernard further elucidated the question. He ascertained that the surface became more sensitive and the vessels fuller of blood; that the small arteries pulsated with greatly increased force; and that the temperature was greatly raised on the side of the head operated on, both externally and as to the parts within the cranium; that as to the eyelids and eye there was contraction of the pupil, a narrowing of the opening of the lids, retraction of the eyeball, a projection over it of the third eyelid which the animals operated on possess, and a flattening of the cornea. But when the upper end of the nerve was galvanized these conditions were reversed, and there resulted diminished heat and vascularity, dilatation of the pupil, enlargement of the opening of the eyelids (or staring eye), and protrusion of the globe; in short, he produced exophthalmos.[2] And the tendency to it was so forcible under these circumstances, that the phenomena were manifested in an animal which held the eye tightly shut, in consequence of a drop of liquor ammoniæ having been dropped into it. Here, then, we have a clue afforded as to the nerves and the muscular mechanism involved in nervous exophthalmos.

"Nor is this all. In the increased sensibility, heat, and vascular activity of the side of the head operated on, there is a proof of the influence of local morbid states of the nervous system on the development locally of those phenomena as symptoms. Now, these are leading points to be investigated, and at the first glance it might be supposed (as I certainly was led to think), that the exophthalmos and increased vascular activity in the head, neck, and face observed in these cases, might be attributed to the pressure of the enlarged thyroid on the cervical

[1] Histoire de l'Académie des Sciences, 1727. "Mémoire dans le quel il est démontré que les nerfs intercostaux fournissent des rameaux qui portant des esprits dans les yeux."

[2] Comptes Rendus, tom. 36, p. 375.

sympathetic, or to some other lesion of that nerve sufficient to influence its functions. The objections to this theory, however, are manifest. Not only have we numerous examples of very large bronchocele without such results, but exophthalmos frequently occurs when there is no bronchocele. Besides, if this cause be admitted (and in some instances at least it may be a cause), how comes the heart to be in pathological relation with the eyes? In truth, until the last few years, the attempt to solve the questions thus arising was hopeless; happily experimental research has demonstrated a hitherto unknown physiological connection between the eyeball and lids, and a definite tract of the spinal marrow. Two eminent physiologists working together, viz., Dr. Waller and Professor Budge, discovered that if they galvanized that portion of the spinal cord of a rabbit which extends between the first cervical and the sixth dorsal vertebræ, they excited dilatation of the pupil. They, therefore, designated this region the 'cilio-spinal region.' The point of maximum intensity was found to correspond in the frog to the articulation of the second and third dorsal vertebræ, and to the origin of the second dorsal pair of nerves.[1] Following up these researches, Prof. Claude Bernard has recently traced a connection in the dog between the anterior roots of the two first pairs of dorsal nerves and the muscular mechanism of the eye. If these were divided on one side without injuring the spinal cord or the sympathetic in the thorax, the eye of that side is affected, the pupil contracts, the opening of the eyelids narrows, and the eyeball is retracted and diminished; but there is no increased sensibility, heat, or vascular activity induced. And when the peripheral ends of the divided nerves are galvanized, the same results follow in the eye as when the upper end of the cervical sympathetic is galvanized—that is to say, widening of the eyelids, dilatation of the pupil, and exophthalmos. Hence the conclusion, that the motor nerves of the eyes of the dog originate and decussate in the spinal cord at the dorsal region. It is necessary, however, according to the results of Prof. Claude Bernard's researches, to distinguish between the sympathetic and spinal nerves of the eyes. When he divided the ascending trunk of the sympathetic on the side of the vertebral column between the second and third rib, carefully avoiding the spinal cord and nerves, he induced increased sensibility, heat, and vascularity of the ear and lateral half of the head on the same side, but no change in the eyelids, eyeball, or pupil. Hence the conclusion, that the nerves subservient to heat and vascular activity (the vascular and calorific nerves) are sympathetic, those which regulate the movements of the eye are spinal. But these motor nerves are equally with the vascular (including the cardiac nerves), and the calorific in relation with that portion of the cerebro-spinal axis which influences the circulation and muscles of expression when emotions are experienced; and this is true, even of the emotional state of feeling termed pain, for Claude Bernard found that if any sensory nerve be pinched from the sciatic to the fifth, reflex ocular movements result, constituting dilatation of the pupils and widening of the eyelids. I do not propose on this occasion to explain the connection between these conclusions and the causes of the palpitations, arterial pulsations, vascular bronchocele, heat of surface, and increased sensibility, and other symptoms which accompany the exophthalmos, because the subject merits a separate consideration. I would only observe that it has been long known that the heart and vascular system are the seat of various functional disorders of a painful kind, in cases of so-called spinal irritation, especially in young women predisposed to hysteria and hysterical affections. In such patients, nervous and hysterical palpitations, in all respects resembling those of the disease in question, exclusive of the bronchocele and the exophthalmos, are very frequent. Many years ago, I pointed out the fact that the motor fibrils of the heart are derived from the spinal cord as well as from the sympathetic, and thus tried to explain the character and origin of these nervous or hysteric palpitations, and indicated the diagnosis.[2] All the most recent researches on this point tend to establish these views, and to prove that the heart is in direct relation with a special motor tract of the spinal cord, commencing and continuous upwards

[1] Comptes Rendus, tom. 33, p. 372.

[2] On the Nervous Diseases of Women, p. 270. London, 1840.

with this oculo-spinal region. Consequently, any sufficient causes acting morbidly upon that portion of the cord, or upon the cerebral connections within the cranium (as during emotions), or upon the motor roots of the two or three first pairs of dorsal nerves, would tend to induce not only the 'oculo-pupillary changes,' but also increased vascular activity in the region of the cervical sympathetic, and palpitation of the heart. These remarks apply with equal force to certain cephalic symptoms, and which are quite as prominent as the conditions just examined; such as tinnitus aurium, flushes, nervous headaches, neuralgia of the face and orbits, and wakefulness; and also to the precordial anguish, painful sensibility of the trunk, and neuralgia of the spine and upper extremities. Some of these are due to morbid conditions of the cervical sympathetic primarily, others to affections of the ganglia on the posterior roots of the spinal nerves (the intervertebral ganglia), and of the sensory tract, occurring either consecutively to the vaso-motor neuroses, or arising independently. The whole subject is, however, too large in extent to be examined now.

"*Orbital Exophthalmos.*—It is necessary, however, to an accurate diagnosis of the various forms of staring and protruding eye, to examine the relations of the eyeball to the Gasserian ganglion, which is the ganglion of the posterior roots of the nerves of the face; for, undoubtedly, a species of exophthalmos arises in consequence of diseased states of that ganglion. This connection was first demonstrated experimentally by Magendie in 1824, and pathologically by M. Serres in the following year. Of later years Schiff has very successfully investigated the subject. As the experiments of Professor Claude Bernard are more accessible, I need only remark that, by an ingenious method of operating, he divides the trunk of the fifth nerve in rabbits and dogs: the result is, that a degree of exophthalmos immediately takes place, and the cornea becomes more conical.[1] It is, however, of much diagnostic importance to observe that the vascular phenomena which accompany this kind of protrusion of the eyeball are very different from those already described as of spinal or sympathetic origin; for, though turgescence of the vessels of the conjunctiva takes place, the heat and vascular activity of the tissues involved are not increased, but strikingly diminished; so that, when the animal is in bad health, inflammation of the conjunctiva, with opacity and necrosis of the cornea, follow, and the eye is destroyed. And there is a probability, at least, that the effects of the injury are felt in the brain beyond the orbital tissues. Now, as structural disease of the ganglion has been proved by Serres and others, as also my own observations show, to be followed by similar changes, we have in these facts a ground for diagnosing trigeminal or orbital exophthalmos from sympathetic or spinal. In several recorded cases there were myopia, neuralgia, œdema of the eyelids and conjunctiva, passive congestions and inflammations of one eye, or of one predominantly if both were protruded. Such phenomena enable us to distinguish a trigeminal from a sympathetic or spinal exophthalmos, because, in the sympathetic kind, the nutrition of the eye is not only wholly unaffected, but the increased vital activity of the tissues enables them to resist cold and the other causes of inflammation, even although not covered by the lids. This peculiarity of the exophthalmos under consideration is particularly noticed. When the fifth is affected, the results are wholly different. The case communicated to Mr. Fisher by Dr. Désgranges was probably of this trigeminal kind.[2]

"*Sources of Fallacy in Diagnosis.*—It is probable, however, that in a certain class of cases both kinds of nerves are involved, and then the diagnosis will be doubtful. For, when this takes place, there will probably be a remarkable modification of the phenomena as caused by either singly. If, for example, congestion, a lower temperature, defective nutrition, and other changes, have occurred in the eye from injury of the fifth nerve, a lesion of the cervical sympathetic will relieve the congestion and restore the temperature, or, in other words, will antagonize the morbid influence. Claude Bernard found that the temperature of the left ear of a dog fell 3° C. below the right ear after division

[1] Leçons sur la Physiologie et la Pathologie du Système Nerveux, 1858 tom. ii. p. 51 et seq.

[2] Archives Générales, 1859. Exophthalmie Cachectique, Obs. v. p. 533.

of the fifth on the left side; but, when he divided the left cervical sympathetic, the temperature of the left ear rose 6° C., while that of the right fell 6° C.[1] If, therefore, a case were met with in which both kinds of nerves were involved, the pathognomonic signs of neither the one nor the other class of lesions would be manifested, and thus the singular result would follow of serious nerve-injuries so antagonizing each other as to remain totally obscured. Another source of fallacy in cases of centric origin will be found in a physiological fact almost wholly, if not altogether, overlooked by physiologists, but which I have seen so often illustrated by disease, that I am satisfied it is of frequent occurrence, and that is the crossed action of the sympathetic nerves and ganglia, owing to decussation of their fibrils and commissures in the cerebro-spinal centres.[2] I have seen remarkable examples of this crossed action in anasarca; as, for example, in a woman in the clinical wards in November, 1861, who had valvular disease and the most extreme œdema of the extremities. She had an attack of hemiplegia of the left side, which was due, as the post-mortem examination proved, to plugging of the right middle cerebral artery. Now, there was increased œdema of the right or non-paralyzed leg and arm, but the left leg, which was wholly useless, ceased to be anasarcous, and became quite small. Here the injury to the right hemisphere plainly led to the change in the left limb. To what extent these central changes in the vaso-motor system influence the states of the circulation in distant parts is as yet wholly uninvestigated, but I am inclined to think they modify the production of exophthalmos and the vascular changes in at least certain cases of general paralysis.

"*Ptosis or Drooping Eyelid.*—The condition of the eyelid, as distinct from that of the eyeball, is of importance in diagnosis; there may be a staring eye without a protruding globe. Now, taking the results of Professor Claude Bernard's experiments as a guide, I think it may be inferred that the drooping or partially closed eyelids may be as pathognomonic as the widely open; nay, perhaps more conclusive, inasmuch as paralysis of the cervical sympathetic is much more likely to occur as a morbid state than that half-tetanic, excited condition, which galvanization induces. And it is perhaps for this reason that the staring eye is comparatively so rare. A drooping eyelid, therefore, with or without retraction of the eyeball, together with greatly increased vascular activity in the neck, head, and eyes, may be more pathognomonic than the staring eye with its widely open lids. In the case of paroxysmal exophthalmos or proptosis already referred to, symmetrical ptosis or drooping lid was a very striking symptom when there was no excitement. When one eyelid is affected the lesion is probably local. I had recently an example of this kind in the case of a female patient sent to me from Ireland by a medical friend. He informed me that she had long suffered from dull heavy frontal headache, aggravated by stooping, and accompanied by vertigo, muscæ volitantes, and ringing in the ears, and sometimes with nausea and vomiting. At the same time she had a good deal of thirst, and habitually cold feet. A confined state of the bowels and weakness of the back had come on during the last three years, and, within the last three months, drowsiness, tenderness of the eyes on pressure, intolerance of light, and ptosis, particularly of the left eye, leading to the suspicion of obscure cerebral disease. On examination I found that there was a thick neck and a small bronchocele, of which the right half was larger than the left. The ptosis was now limited to the left eye, the patient being unable to raise the lid, and there was increased heat on the left side of the head. After treatment with extract of chamomile, nux vomica, and sulphate of iron, in small doses, the ptosis and other symptoms disappeared, and the enlargement of the thyroid was now restricted to the right lobe. It is worthy of notice that thyroideal and glandular enlargements had occurred in three or four of this patient's relatives."

Prof. L. draws the following general conclusions from these facts:—

"1. That the exophthalmos under consideration is specially due to disorder of the nervous system. 2. That it varies in character and diagnostic significance accordingly as it is associated or not with other phenomena involving the vas-

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[1] Leçons, etc., tom. ii. pp. 480–482.

[2] See this question mooted in my "Mind and Brain," vol. ii. pp. 400 and 405.

cular system of the heart, and of the eyes, head, and neck—the carotideal as distinct from the vertebral system of capillaries. 3. That it is sometimes of spinal, sometimes of cranial origin; and that in either case its nature and seat may be diagnosed. 4. That it occurs under a variety of morbid conditions of the nervous system.

"If it might be permitted to theorize on the causes of symptomatic exophthalmos from these data, we might conclude that, when it occurs in strangulation, it is probably due to mechanical injury to the cervical sympathetic by the tightened cord or other violent means used; in the emotional form the condition is probably like that when the sympathetic is galvanized, the face being pale, and the eye staring; in certain morbid cerebral conditions, such as mania, with epilepsy and general paralysis, the lesion is probably in the first instance paralysis of the sympathetic, and subsequently of the fifth and seventh; and, finally, that in the class of cases under consideration, when the exophthalmos is symmetrical, it is spinal; the cervical and upper dorsal region being the seat, together with the corresponding cervical and dorsal divisions of the sympathetic; but when unsymmetrical, it is due to disease of the trigeminal ganglion and branches of the fifth pair."

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41. *The Calabar Bean as a Contractor of the Pupil.*—Dr. D. Argyll Robertson states (*Edinburgh Med. Journ.*, March, 1863) that, recognizing the numerous advantages that would flow from the discovery of a substance, which when applied to the conjunctiva should produce effects exactly opposite to those well known to result from belladonna—which would stimulate the muscle of accommodation, and the sphincter pupillæ as the above-named remedy paralyzes them—he had been endeavouring to discover such an agent without success, when Dr. Frazer informed him that he had seen contraction of the pupil result from the local application of an extract of the ordeal bean of Calabar. Dr. R. accordingly obtained some Calabar beans, and made three extracts of varying strength with which he instituted a number of experiments.

"These experiments prove," says Dr. R., "that the local application of the Calabar bean to the eye induces—*first*, A condition of short-sightedness. That this is present, and the cause of the indistinctness of distant vision cannot be doubted, as it is relieved by the use of concave glasses. The fact that objects appear larger and nearer than natural may be attributed to the induced myopia. And, *second*, It occasions contraction of the pupil, and sympathetically dilatation of the pupil of the other eye. We further observe that atropine possesses the power of counteracting its effects, and, *vice versa*, that it is capable of overcoming the effects produced by atropine. The first symptom noticed is dimness of distant vision, and shortly after the pupil becomes contracted; the symptoms also subside in the same order, first the derangement of accommodation, and then the affection of the pupil.

"Let me now say a few words as to the method of action of the Calabar bean. In respect to its effects on the pupil, they might be produced either by causing contraction of the circular fibres of the iris, or by paralyzing its radiating fibres. I am inclined to believe that the contraction of the pupil is due to increased action of the sphincter pupillæ, and this chiefly on the ground that the other effects produced by the Calabar bean can only be explained by an induced contraction of the ciliary muscle—the muscle of accommodation; and as the sphincter pupillæ and ciliary muscle are both supplied by the ciliary nerves, I think the most feasible explanation of the action of the Calabar bean on the eye is to regard it as a stimulant to the ciliary nerves. In favour of this view we have the feeling of straining in the eye shortly after the physiological effects are produced. The alteration, too, in the accommodation of the eye exhibits much of the character of a spasmodic action; thus we find in experiment *third*, after the second application of the Calabar bean, that the extent of distinct vision is limited to 3 inches, viz., from 6 to 9 inches from the eye, but an hour after distinct vision extends to any distance beyond 5 inches. It has also been observed that the accommodation of the eye is not usually affected in cases where contraction of the pupil is due to lesion of the sympathetic (exemplified in a case narrated by Dr. von Willebrand in the *Archiv. für Ophthalmologie*, vol i.,

where contraction of the pupil depended on the pressure of enlarged glands on the cervical sympathetic, and where no affection of the accommodation was present).

"As regards the cases in which this substance may be applied in practice, it is applicable in all instances where atropine is used to render the examination of the eye more perfect or more simple. This includes two classes of cases, those to which dilatation of the pupil is either necessary or desirable to aid ophthalmoscopic examination, and those in which paralysis of the ciliary muscle is necessary, in order to ascertain the state of the accommodation of the eye.

"In cases of retinitis, with photophobia, I think it might be advantageously employed to diminish by contraction of the pupil the access of light to the retina, and this more especially in those cases of this disease where the pupil has been dilated for the purpose of ophthalmic examination.

"The cases, however, in which I should expect this remedy to produce the most beneficial effects are those in which paralysis of the ciliary muscle occurs as a consequence of long-continued debilitating disease. Cases of this kind are occasionally reported as following attacks of typhus or other fevers. The dimness of vision that forms a frequent sequela of diphtheria appears also to be due to this cause, judging from the symptoms detailed by Dr. Begbie in an admirable paper on diphtheria, recently published in this Journal; therefore, in these cases, good effects may be expected from the use of the Calabar bean.

"In cases of ulceration at the margin of the cornea, leading to perforation, or even when prolapsus of the iris has just occurred, as well as in cases where the iris has a tendency to protrude through a corneal wound, the contraction of the pupil induced by this agent might prove serviceable by drawing the iris away from the circumference."

In a subsequent paper (*Edinb. Med. Journ.*, June, 1863), Dr. R. says that the solution of the extract of Calabar bean which he employed became decomposed and fetid by keeping, and produced irritation when applied to the conjunctiva. The substitution of glycerine for water produced a still more irritating application, and he now employs simple syrup as a suspensory medium, which so far as he has tried answers very well.

In the *Medical Times and Gazette* of May 9th, under the head of Provincial Correspondence, is a report of a case of dilated pupil, with confused vision, the result of a blow on the eye with a stone, the details of which Mr. Neill had laid before the members of the Liverpool Medical Society, in which the Calabar bean had proved most serviceable in causing contraction of the pupil and improvement of vision, and this after veratria had been employed without producing any benefit. Although it is not mentioned, the dimness of sight in this case in all probability depended on paralysis of the ciliary muscle, which condition being corrected by the use of the Calabar bean, distinctness of vision returned. This is the more likely to be the case, as, in almost all cases of simple dilated pupil, affection of the accommodation due to paralysis of the ciliary muscle is found to be present.

In a letter published in the same number of the *Medical Times and Gazette*, Mr. Woolcott testifies to the efficacy of the ordeal bean as a myositic or contractor of the pupil.

Mr. Soelberg Wells has also had successful results from the use of the Calabar bean in a case of paralysis of the ciliary muscle and sphincter pupillæ.

[We have found a solution of acetate of strychnia dropped upon the conjunctiva to produce the same effect on the muscle of accommodation, and on the sphincter pupillæ, as is stated to have resulted from the use of the Calabar bean. We have been for a number of years in the habit of resorting to the strychnia with that view, and generally with satisfactory results.

Early in April last, an officer of our navy was brought to me by Dr. Morris, labouring under paralysis of both the constrictor of the pupil and the muscle of accommodation in one eye, which was the more distressing, inasmuch as the sight in the other eye had long been extremely defective. In this case the solution of strychnia produced the most marked effect, and in about six weeks he was able to return to duty with his pupil of its natural size, and his presbyopia relieved.—EDITOR.]

42. *Two Cases of Monocular Cataract; with remarks.* By Ernest Hart.—In operating on the 4th of March last for the extraction of a fully formed cataract, Mr. Hart observed that some surgeons were of opinion that monocular cataract, when fully formed, should always be removed. The present case was that of a young woman, in whom the cataract had formed, without any very apparent cause, in the left eye, the sight of the right eye remaining good. The patient was young and unmarried; the cataract was a considerable deformity; it altogether abolished sight; monocular vision was insufficient for many purposes of life: he did not hesitate, therefore, to extract. Early extraction had been advised in various cases; and an able foreign writer had brought forward a good deal of evidence and argument to show that the existence of cataract in one eye tended, by reflex influence on the nutrition of its fellow, to hasten the production of opacity in the corresponding lens.

In the same ward with the patient just operated on, Mr. Hart mentioned that there was another female in whom also he had extracted the lens for monocular opacity, with resulting benefit, and whose case afforded a striking illustration of the activity of the reflex influence. This was a young woman who had been sent for treatment, as having "suddenly become blind." When brought to the hospital she groped about in darkness, and could not avoid even large objects, requiring to be led and directed at every step. On examination, the right eye showed a lense very opaque, and partially dislocated. The upper part of its suspensory ligament was ruptured, and it moved backward and forward, attached by the lower edge as by a hinge. The iris was paralyzed and tremulous; the eyeball very soft. There was perception of light to a limited extent on artificial lateral and oblique illumination being practised. The left eye was examined ophthalmoscopically. The cornea was natural, and there were no external signs of inflammation; but the transparent media of the eye were so generally turbid and partially opaque that the fundus could not be fully lighted or diagnostically examined. The history was unusual, and very interesting. Partial blindness had come on suddenly in the *right* eye the day after accouchement, with a sudden pain. On being questioned, she said she had just before struck herself a slight blow over the *left* brow. But this did not seem sufficient to explain the partial dislocation of the right lens. The lens thus partially dislocated had become rapidly opaque, and gradually sight had gone from the left eye. Mr. Hart looked upon this affection of the left eye as being in great measure due to the reflex injury to nutrition caused by the dislocated and partially disorganized state of the right, in which the lens was as a foreign body; and therefore, immediately on the admission of the patient, he proceeded to extract the lens. As the iris was in its upper and outer part lying against the cornea, he made a lower section by penetration at the inner angle, using a Beer's knife mounted on a bent stem, which facilitated that proceeding. The section and extraction were thus effected without wounding the iris. The vitreous humour was very fluid, but comparatively little was suffered to escape. The looked-for effect of the operation upon the opposite eye has been satisfactorily and rapidly developed. How far sight will be restored in the partially disorganized ball from which the dislocated lens was removed is of course doubtful; but in the right [left?] eye vision was largely restored, so that on the eighth day the patient could see to feed herself, to move about, and to assist somewhat in the dimly-lighted ophthalmic ward. Mr. Hart observed that, besides the interest which attached to the case as an instance of reflex nervous influence on nutrition, the nature of which Dr. Brown-Séquard had fully exposed in his important physiological works, the origin of the dislocation was worthy of study. Parturient women were apt to fall into a state of weakness in which such rapid failures of nutrition were wont to occur, and he believed that the dislocation was probably spontaneous and due to that cause. Throughout the convalescence from the operation he had treated the patient with full doses of tincture of the sesqui-chloride of steel, and meat and beer; and he thought that if the old antiphlogistic system had in any measure been adopted, the patient would probably have been blinded for life in both eyes. Several of the affections of the eye were modified in an interesting manner by parturition and lactation, and their treatment should be similarly altered.

[We lay these cases before our reader because they possess some points of

interest, though we are not prepared to indorse the theoretical views of Mr. Hart. We have seen so many cases of monocular cataract, in which the other eye remained for a long period in its normal condition that we cannot believe the existence of cataract in one eye often tends, by reflex influence on the nutrition of its fellow, to hasten the production of opacity in the corresponding lens. This opinion we believe to be purely hypothetical.

With regard to the second case, the affection of the left eye, it seems to us, was most probably simply a repetition of the same morbid action which had disorganized the right eye; though doubtless after the lens of the right eye became dislocated it acted as a foreign body, and must have exerted an injurious influence on its fellow.]

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43. *Acute Glaucoma successfully treated by Iridectomy.*—Mary W——, aged 73, a monthly nurse, always had good health, and up to Christmas last had never suffered any inconvenience or annoyance whatever from her eyes. One night about that time, whilst nursing a lady, and after two or three nights' watching, during which she had little or no sleep, she was, whilst half dozing in a chair, aroused with fright by a noise produced by the breaking of the window-rope, causing her to think that some one had entered the room. This occurred at two o'clock A. M. An hour or so after this, she had violent pain in the left eye and in the head, accompanied by nausea, but no vomiting. The pain was so severe that she remembers no other symptom. At nine o'clock in the morning she was quite blind with that eye, and unable, she says, to distinguish light from darkness. She did not apply for any advice, nor undergo any treatment, although the eye continued exquisitely painful, and from her account seems to have become acutely inflamed. Compelled to leave her situation, and wanting almost the common necessaries of life, she came to the Royal London Ophthalmic Hospital, and was admitted on the 6th February.

State of the left eye on admission.—The whole globe acutely inflamed; tension extreme (T 3); the cornea rough and semi-opaque, and the humours within, as far as could be seen, quite dull. The eye was intolerably painful; indeed, it was on account of the unbearable pain, as she described it, that she sought for relief, and was willing to undergo any treatment to gain it. She had no perception of light.

As the eye was useless, very painful, and clearly undermining the patient's health, Mr. Bowman removed it. After the operation all pain ceased, and for a few days she progressed most favourably. She was again able to sleep and to take her food, and expressed herself as feeling quite well.

On Feb. 12th, six days after the excision of the eye, she was at two o'clock in the afternoon seized with pain in the right eye, and she saw, she says, beautiful colours like a peacock's tail in the sun. The pain in the eye increased, and so severe was it at the top of her head that she felt she could hardly rest on her pillow. She did not vomit, although she had a great feeling of sickness. In the evening she saw around the candle in the ward a large rainbow, and the light of the candle appeared red.

On the following morning (the 13th) she was seen by Mr. Bowman. She had passed a very restless night, and the pain in the eye and head continued. The tension of the globe was increased (T 3). She was unable to read letters of No. 20 of Jaeger's test-types, or even to discern features, and could only just manage to count fingers at the distance of six inches. Under these circumstances Mr. Bowman at once performed iridectomy, removing a large portion of iris in the upward direction. Soon after the operation she began to experience relief. She passed a good night without opiates, and in the morning there was a decided improvement in the sight. She continued to progress most favourably, the tension of the eye became permanently normal (T n), and all pain in the eye and head completely left her. In about a fortnight she was discharged from the hospital to attend as an out-patient.

Her sight has steadily improved since the operation, and the report (May 4th) states that with a 20-inch focus convex glass she is able to read No. 2 or pearl type. The convex glass she is obliged to use for reading is not so strong as is ordinarily required at the advanced age of this patient.—*Lancet*, May 23, 1863.

MIDWIFERY.

44. *Displacement of the Bladder as a Cause of Tedious Labour.*—Dr. W. H. Broadbent, read before the Obstetrical Society of London, March 4, 1863, a communication, the purport of which was to show that, besides the mechanical obstruction which may be presented by the prolapsed and distended bladder to the descent of the head of the child, prolapsus of the bladder, complete or partial, frequently renders the first stage of labour long and painful. The uterine contractions, causing pain in the displaced bladder, it was said, were replaced by spasmodic contractions of the abdominal muscles, which forced down the uterus, but had no effect in dilating its mouth. These were attended with much suffering, of a character very different from the natural labour pains at this stage, which with tactile examination would lead to a recognition of the cause. The measures recommended for the relief of the pain and for expediting the progress of the labour were the supine position, prevention of accumulation of urine by the use of the catheter, and, in severe cases, chloroform. Cases were given in support of these conclusions.—*Med. Times and Gaz.*, April 18, 1863.

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45. *Case of Utero-Placental Adhesions which gave rise to severe Symptoms.* By Dr. Delord.—The questions of inflammation, adhesions, retention, and absorption of the placenta, are still enveloped in sufficient obscurity to authorize every practitioner to endeavour to throw light upon them by his personal experience. I may, therefore, be permitted to publish an observation which appears to me interesting, in reference to the above points.

In the month of May last, I was sent for by the wife of a notary, who was entering upon the ninth month of her first pregnancy. Although I could recognize no sign indicative of the commencement of labour, Mrs. A. experienced dull constant pains in the loins and abdomen. Movement somewhat increased these pains, but not to such a degree as to render them insupportable. I prolonged my examination; and pressure, carefully and methodically exerted over the whole surface of the uterus, having failed to discover any sensitive point, I concluded that the seat of the pain was situated more deeply. Pressed by my questions the patient stated, that independent of the lumbar and abdominal pains, she experienced a peculiar dull pain, which was constant, and was located in the right portion of the fundus of the uterus. This avowal removed all the doubts I might have entertained, and I considered myself justified in diagnosing an inflammation of the placenta, to combat which I prescribed repose, a light diet, and injections. Under the influence of this treatment Mrs. A. felt better, but she still experienced an unusual sensation, a sort of weight and dragging in the region of the uterus. The result proved that, in referring this sensation to the existence of utero-placental adhesions, I was not deceived. On the 18th of the following June, Mrs. A. was delivered at the full time of a healthy infant. Under any other circumstances I should have waited, according to the obstetrical rule I have laid down for myself, the natural expulsion of the placenta; but as in this case I had serious grounds for apprehension, I applied slight frictions over the uterine region, hoping in this way to give rise to some effectual contractions, and so to hasten the delivery. At the end of half an hour of vain expectation, I administered a full dose of the decoction of ergot. The effect of this soon seemed to manifest itself; but at the same time the patient turned pale, and I discovered that internal hemorrhage had taken place. The cord, rendered friable by inflammation, gave way under the traction which I considered it right to employ without delay. I introduced my hand into the uterus from which a gush of blood took place; fainting fits succeeded one another, and the poor mother seemed on the point of death. In this critical situation I compressed with my left hand the abdominal aorta; then, by means of my right hand introduced deeply into the uterus, I separated all that part of the placenta which could be detached, pinching at the same time the inner surface of the uterus, with a view to provoking salutary contrac-

tions. This manœuvre was crowned with success, and the patient was thus saved from the immediate danger of hemorrhage. But if the condition of matters was now less alarming, the fact of the retention of a considerable portion of the placenta could not but inspire me with inquietude. A consultation was held, and the unanimous opinion was, that the sole indication for the present consisted in sustaining the strength of the patient, and in extracting the remains of the placenta by every possible means. The next day the pulse became rapid, and the abdomen became somewhat painful over the uterine region. During the following days a sanious and fetid discharge took place from the genital organs. There were occasional rigors, extreme prostration, and other signs of purulent absorption. The treatment consisted in the administration of beef-tea, sulphate of quina, and cinchona wine, and in the employment of detersive and disinfectant injections. As to extracting the remains of the placenta, the idea required to be abandoned, as the patient peremptorily refused to allow any such attempt to be made. Nevertheless, after a few days, a portion of the placenta was expelled naturally, when, for a second time, alarming symptoms threatened to compromise the life of Mrs. A., which, however, yielded to the treatment previously employed. On the 14th of June a second fragment of the placenta was expelled. From that time the amelioration was progressive and uninterrupted. Convalescence was established in the course of the fourth week, and on the 30th of August I could convince myself that the health of Mrs. A. was perfect.

In this case, as in another which occurred to me in 1840, absorption of the placental substance retained in the uterus by adhesions consecutive to plastic inflammation of the placenta, took place without accident. The symptoms of putrid absorption observed in the present case depended exclusively on the presence of fragments detached from the mass of the placenta, as was proved by the circumstance that, after the expulsion of the fragments, all the dangerous symptoms disappeared. From these facts we may conclude that resorption of the placenta is only possible when it has been united to the surface of the uterus by means of an organized plastic growth, and when a common life has been established between the two organs by means of vessels of new formation. Under these circumstances, resorption may take place without any bad symptoms. If, on the contrary, the placenta has separated in a mass, it is only susceptible of diminution by means of putrid decomposition, and then it acts as a foreign body and as a source of infection, giving rise to accidents which are almost always mortal.—*Ed. Med. Jl.*, June, 1863, from *Journal de Méd. et de Chirurgie pratiques*, March, 1863.

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46. *Ovarian Disease Complicated with Pregnancy.*—The *Dublin Med. Press* of April 29, contains an account of a case in which pregnancy complicated an advanced state of ovarian disease. Dr. Donovan, of Skibbereen, who relates the case, states that the patient, a woman named Mary Fitzgerald, came under his care about four years ago. She was married, and the mother of two children. At that time he detected an ovarian tumour in the right iliac region, which he treated by pressure and iodine inunction. Twelve months after, the bulk of the tumour had so much increased that he determined on paracentesis, and drew off fifteen pints of a thickly gelatinous fluid. She made a good recovery, but five months after, the tumour having again filled, he again performed the operation of tapping, and drew off eighteen pints of a black, muddy-looking fluid, with a very offensive smell. A sharp attack of inflammation supervened; on its subsidence, the abdomen again enlarged, and he had again recourse to paracentesis, evacuating about sixteen pints of purulent fluid, probably the product of inflammation of the cyst. After this he lost sight of the patient for nearly a year. He was then summoned on a dispensary ticket to visit her, and was told by her husband to bring the instrument, as she was in great pain, and required to be tapped at once. He found her in great agony, but the pain recurred at intervals, and from its character he was induced to make an examination *per vaginam*. A child's head was at once discovered in the passage; labour went on regularly, and in a few hours she was delivered of a healthy full-grown infant. The woman died some months after from the ovarian disease.

47. *On the Influence of Vicarious Menstruation on Ovulation.*—Dr. Puech has communicated to the Academy of Sciences, Paris, a paper of which the conclusions are the following :—

1*st*. Vicarious menstruation, supplemental hemorrhage, is said to exist, when at the regular periods a flow of blood takes place elsewhere than from the genital organs.

2*d*. All parts of the body may be the seat of these hemorrhages; nevertheless, they occur more frequently in some localities than in others; thus, in Dr. Puech's cases, they were met with, from the stomach 32 times, from the breast 25 times, from the lungs 24 times, from the nasal mucous membrane 18 times.

3*d*. In all cases which have been carefully observed, antecedents either of hysteria, or of an exaggerated nervous sensibility, have been noticed.

4*th*. In general the menses have been absent (183 times), but sometimes (15 times), at the very time of occurrence of the vicarious menstruation, a slight flow of blood has been noticed.

5*th*. The genital organs are generally healthy, although they have sometimes been found abnormal. In 11 cases there was atresia, either congenital or accidental.

6*th*. With the exception of these last-mentioned cases, absence of the menses does not imply sterility; except in the case of grave disorders, ovulation continues to take place, and the rupture of the Graafian vesicle corresponds with the period of vicarious menstruation.

7*th*. Pregnancy, accordingly, is possible, and has been observed. It suspends the deviation for the time, although it may reappear after the confinement, or at the cessation of nursing.

8*th*. Although compatible with health, and occasionally existing for the whole period between puberty and the time of cessation of menstruation, the deviation is a pathological condition; nay, more, it is not free from danger, having occasionally been the cause of death.—*Ed. Med. Jl.*, June, 1863, from *Gaz. des Hôpitaux*, April 21, 1863.

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48. *Icterus in Pregnant Women.*—Dr. O. Saint-Vel relates that in 1858 the island of Martinique was, without appreciable cause, visited by an epidemic of jaundice, remarkable for its severity in pregnant women. It broke out at St. Pierre towards the middle of April, attained its maximum height in June and July, and terminated towards the end of the year. All races were attacked; the patients were mostly adults; no liver-complication could be detected; nor could any resemblance be traced between the disease and yellow fever. It was fatal to females only, especially during pregnancy. Of thirty pregnant women who were attacked at St. Pierre, ten only arrived at the full period of pregnancy without presenting any other symptoms than those of ordinary jaundice. The other twenty all had abortion or premature labour at the end of a fortnight or three weeks, and died in a state of coma, which appeared a few hours before or after the abortion. The females who died were from the fourth to the eighth month advanced in pregnancy. In some cases, slight delirium preceded the coma, which was never interrupted, but became more and more profound up to the time of death. Its longest duration, in two cases, was twenty-four and thirty-six hours. It was not preceded by any notable modification of the general sensibility, nor of the respiration or circulation. Hemorrhage was absent, except in one case, where a female had it before delivery. When death was delayed till three or four days after delivery, the lochia were healthy. Almost all the children were stillborn; some lived a few hours; one alone survived. None of them had the icteric colour; nor was there any sign of jaundice in the ten children who were born at full term of mothers who had had the disease.—*British Med. Journ.*, Feb. 7, 1863, from *Gazette des Hôpitaux*, Nov. 20, 1862.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

49. *Attempt to Restore to its Natural Appearance a Putrefied Dead Body, in order to prove its Identity.*—Dr. B. W. RICHARDSON gives (*Lancet*, May 16, 1863) an account of some very interesting and important experiments which he has made to ascertain whether a human body that had undergone putrefactive change to such a degree as to be unrecognizable, could be so far restored to the appearance of life as to be sworn upon in respect to its identity.

The circumstance which led to this inquiry was as follows: "A woman named Emma Jackson was murdered in St. Giles by having her throat cut in a house of ill-fame, to which she had retired with a man who had been seen by at least three persons, and whose appearance was clearly defined by them. This man, by some strange and almost inexplicable method, made his escape from the house without being seen to depart, and has not since been detected. Several persons have, however, been suspected, and one or two have been temporarily detained, but on examination they have been discharged.

"On Monday, May 4, a man was dragged dead from the Thames, who, in many respects, seemed to answer to the description given of the assumed murderer. On the following Wednesday Mr. Humphreys, the coroner for East Middlesex, held an inquest on the body of this man, but decomposition had advanced so far that none of the witnesses could arrive at any conclusion whatever respecting the body; it was, in fact, utterly unrecognizable. This statement having been made in the public papers on Thursday morning, I formed an opinion, derived from some researches on dead tissues, that it might be possible to alter the appearance of the body so much as to enable the witnesses to speak to its identity."

Dr. R., assisted by Dr. Edmunds, entered on the investigation.

"At half-past ten on Saturday we were taken," says Mr. R., "to the dead man, who was lying in a shell in the dead-house in Darby-street, Tower-hill. He was dressed as he was when taken out of the water. His body generally, with the exception of the hands, was deeply discoloured, and the face was so changed that is was quite impossible to form any opinion respecting either its colour or feature; it was as black as the face of the darkest negro, and had it not been white when he was taken out of the water I should say that the man would have been returned as a negro. The lips were enormously distended, and the nose was scarcely visible; the cheeks and eyelids were also greatly distended. In fact, the putrefactive changes were so advanced that it required some little determination to proceed. Following, nevertheless, the course I had marked out, we immersed the body in water, and then added to the water twenty pounds of common salt; we also added gradually, in the course of the operation, one pint of common hydrochloric acid; and the body was allowed to remain under this solution for two hours. The object of this part of the process was to reduce the swelling of the features by exosmosis. The shell, being water-tight, answered as a bath.

"Meanwhile we charged a pail of water with fresh chlorine, and then, lifting the face out of the water in the shell, treated it with the chlorine water. I also directed a stream of chlorine gas for some time upon the face. The object of this part of the process was to restore the white colour.

"A little before one o'clock both of the intentions we had in view were realized to a considerable degree. The tumefaction was relieved; and the face, from the deepest black, had become of the cast of light clay, common wood-ash, or the darker sort of straw-paper. When the chlorine in vapour was passing over the face the skin approached to white, but so soon as it was withdrawn the change to clay-like hue returned. So much was now accomplished that we were able to form a fair estimate of the man. We found that he was evidently a young man, not more, probably, than twenty-one years of age: he had a short feeble moustache; his lower lip had a short soft beard that had not been shaven, and

his whiskers corresponded; his face was naturally round and full, and, indeed, his body generally was well nourished.

"At one o'clock we left, and returned at two. We had arranged that a stream of chlorine should continue to play over the face in our absence, but, as we had no one to leave in charge, the gas had become exhausted, and the face was a little darker when we returned.

"Pursuing still the course I had pre-arranged, we opened the body. We found the viscera but little decomposed, and natural; the heart was empty and flaccid; the lungs free from congestion. We fixed a large tube in the aorta, through the left ventricle; and Dr. Edmunds tied the aorta in the thorax, so as to prevent any passage of fluid to the lower part of the body, and to the abdominal viscera. Then we injected a solution, consisting of chlorine water, chloride of zinc, and a little sesquichloride of iron. The object in this instance was to impregnate the tissues from within with the decolorizing agent, and to reduce the tumefaction. On forcing the injection, we found that great escape took place through the vessels that had been divided in opening the thorax. We therefore withdrew the tube from the aorta, and as the face was the part chiefly requiring attention, Dr. Edmunds laid bare the common carotid on the right side, and a small nozzle from the syringe was introduced into that vessel and tied. It must be understood that much care was required in forcing the injection through structures so decomposed and yielding, and that we dare not push this part of the operation too far. Had we used much force we should have produced extensive infiltration through the broken capillaries, and have destroyed the facial structures altogether. So soon, therefore, as the face was subjected to slight tension the injection process was stopped. The time had now approached for the sitting of the jury at half-past four P.M. We allowed all the water to drain away, drenched the body with pure water, and left it with the face covered with a piece of thick cloth, on which was poured a little hydrochloric acid and methylated alcohol. The face at this time was of a clayey colour, and a little more full than natural; and although we felt that we had not brought it up to its perfect natural appearance, we believed that it might be recognizable by any one who had seen it during life, and especially that it was a face which a witness could swear was not that of any particular person whom he remembered, if there were not strong natural resemblances between the two.

"The result indicated that we had effected even more than we had anticipated, and that, if we had not succeeded to the perfection we could have wished, we had fulfilled the practical part of our mission and all that was demanded of us; for the three witnesses who were there either to confirm or disprove the hypothesis that the man before them was the man last seen with the murdered woman, each and all swore without hesitation, on their second view of the unknown man, that he was *not* the assumed murderer."

Dr. R. offers the following *reflections* and *suggestions*: "The fact that in a case so extreme as the one named, science has come in to render essential aid to justice, affords, I hope, subject for thought and renewed effort in the same direction. I am far from considering that we ought to stop where we have thus begun. I look upon this case, in fact, as a mere first and experimental trial, which followed up will lead to great perfection in one department of medical jurisprudence; and I feel, consequently, that I cannot conclude this paper better than by pointing out what improvements in the process have been suggested to me by the experience detailed above.

"1. In respect to time. On another occasion I would ask to be allowed at least twenty-four hours for the performance of the process. The period of six hours was insufficient for the full development of the required changes.

"2. I should proceed by stripping the subject of all apparel.

"3. After this the subject should be placed in a water-tight shell, in which a large tap for escape of water should be inserted, and the body should be thoroughly washed with water.

"4. After the washing the body should be covered with water, and held beneath it by a few cross bars of wood. Then the lid of the shell should be temporarily but effectually closed down, and two openings should be made into the lid; through one of these openings the free end of a tube, connected with a

chlorine flask, should be passed beneath the surface of the water; while from the other opening should come another tube, the free end of which should turn over into a glass globe of water. These preliminaries arranged, fresh chlorine should be driven in until the water within is saturated by it, the fact of saturation being determined by the passage of chlorine through the escape-tube. When the water around the body should thus become charged with chlorine, the openings in the lid of the shell should be closed, and the whole should be left undisturbed for twelve hours.

"5. On opening the lid after the interval of time named, common salt should be added to the water, until the hydrometer should stand several degrees above the specific gravity of the blood; the specific gravity of 1,100 would answer for the solution. In this solution the body should remain immersed for twelve hours; the water should then be drawn off and the body examined.

"[If there were no deep decomposition and discoloration, the body, I believe, would now be ready for identification; but if the putrefaction were very deep-seated, it would be requisite to proceed further.]

"6. If necessary, open the trunk of the body at this point, and make any post-mortem observations that may be required. The head should not be opened at this stage.

"7. After the post-mortem examination, in order to restore a more natural expression to the face, solutions should be injected into the external carotid of each side. The form of solutions I should suggest in another case would be—

"(*a*) Water saturated with chlorine, and charged, in addition, with tincture of the sesquichloride of iron in the proportion of two fluidrachms to the pint.

"(*b*) Common fresh milk saturated with common salt.

"Of injection *a*, I would recommend that from two to three ounces should be slowly injected on each side, to be followed, without removing the nozzle of the syringe from the vessel, by so much of solution *b* as should cause the slightest possible tension on the tissues of the face.

"Lastly, if it were requisite to retain the body for some time, it would be advisable to cover it with wood spirit, containing one drachm to the gallon of the tincture of sesquichloride of iron, and to exclude it from the air.

"In offering these suggestions, I beg that they may be accepted as open to revision; the principle recognized, the details are certain, under experiment, to be simplified and improved.

"In conclusion, I have to offer my warmest thanks to Dr. Edmunds for the energetic, friendly, and able part which he took in the very interesting inquiry to which I have called attention. His exertions contributed in a most important manner to the results obtained.

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50. *Siguatera, or Fish-poison Disease.*—There are six varieties of poisonous fishes already known and described—viz.: the perches, the gurnards, the flounders, the spares, the gobies, the sardines, and the globe fishes, the last including two forms—the *Diodon* and the *Tetrodon*.

Confining our attention exclusively to these poisonous fishes, we find that they are most common in the following localities—at all events, that they have been discovered in these localities more frequently than elsewhere: in the Caribbean Sea, off Brazil, New Caledonia, the Seychelles, the Chinese Sea, the Malabar coast and other parts of India.

It should be remarked, that in these poisonous fishes the digestive organs, the spawn, and the liver, are invariably most dangerous; and that there are many fishes that may be eaten with the greatest safety when those parts are avoided. Another fact worthy of notice is the age of the fishes: some are dangerous when they have arrived at maturity. The *Lethrinus mambo*, for example, can be safely eaten when very young, but afterwards is exceedingly dangerous. Some naturalists attribute the poisonous qualities to the food found in the seas frequented by certain classes of these fishes. This is true under some circumstances, as in the case of the *Meletta venenosa*, which at certain seasons of the year feeds upon a green monad which covers the sea in large quantities. Wherever this green monad is seen the *Meletta* is poisonous, but wherever it has

not appeared the same fishes are eaten with the greatest safety. MM. Fonssagrives and Méricourt, agree with M. de Rochas in his opinion respecting the spawn, and with him consider it as the most poisonous part. If such be the case, it could soon be determined by ascertaining whether the injurious properties of the fishes are permanent, whether in the same species adults only are poisonous in their effects, and whether there is poison in those fishes only which contain spawn. To decide these questions, comparative experiments might be made with the male and female fishes of the same species inhabiting the same streams or waters. If it were found that the latter only were injurious, the difficulty would be satisfactorily solved.

The Spanish colonists gave the name of *Siguatera* to that union of symptoms which results from the eating of poisonous fishes indigenous to hot countries. The symptoms which arise are of two kinds. Severe attacks of indigestion or gastro-enteritic poisoning; or an icy coldness and depression, accompanied with great nervous disturbance. The symptoms are the same, whether severe enough to cause death, or only to excite inconvenience or temporary derangement; they differ only, i. e., in intensity. Gastro-enteritic *Siguatera* has all the appearance of a severe attack of indigestion—viz., nausea, vomiting—first of the food, then of mucus—coldness, depression of the pulse, cramp, and diarrhœa. The nervous type of symptoms—viz., convulsion and paralysis, which characterize the process of poisoning by fishes, are not to be found in any case of metallic poisoning. They seem to arise from a combination of accidents, as if they had been produced by different vegetable poisons of narcotic and acrid character. When the *Siguatera* assumes a gastro-enteritic form, the sufferer is, in general, quickly restored to health; while the nervous symptoms leave behind them the most serious traces of debility and irregularity. These have been known to continue for eight or nine days.

As illustrating the way in which the members of crews of vessels are poisoned by the eating of poisonous fishes, the following facts from the "Linnæan Transactions" for November, 1860, are valuable. The history of the circumstance was communicated by Mr. H. Jameson, of her Majesty's ship *Winchester*, to Sir William Burnett. The accident occurred on board the Dutch ship *Postillion*, lying in Simon's Bay, Cape of Good Hope. The *Winchester* being near Mr. Jameson was called to render his services to the sufferers. On arrival he found that the boatswain's mate and purser's steward had been suddenly taken ill after eating a part of a well-known deleterious fish, common in Simon's Bay, and called the toad or bladder-fish—the *Diodon*. They had been warned that the fish was poisonous, but were resolved to try the experiment, the boatswain declaring that the liver was not poisonous, but a great delicacy. They had partaken of dinner at twelve o'clock; immediately afterwards they partook of the fish, and scarcely ten minutes had elapsed when the boatswain became so ill that he was unable to raise himself without the greatest difficulty; his face was somewhat flushed; his eyes glistened, the pupils were rather contracted; his mouth was open; the lips were tumid and somewhat blue; the forehead covered with perspiration; the pulse weak, quick, and intermittent. The patient was extremely uneasy and in great distress, but still conscious; he complained of pain from constriction of the throat, and appeared inclined to vomit. It was with difficulty he could swallow a powder with some warm water. His state quickly assumed a paralytic form; his eyes became fixed in one direction; his breathing was difficult, and accompanied with dilatation of the nostrils; his face was pale, and covered with cold perspiration, his lips livid; his consciousness and pulse failed, and in scarcely seventeen minutes after partaking of the fish he was dead. The symptom exhibited by the purser's steward were of a similar kind. He also died within twenty minutes of the time after he had partaken of the fish.

The quantity consumed between the two men was only the liver of one fish; the liver might have weighed about four drachms. The entire fish measured only from six to eight inches in length.

Other examples similar to the above have been recorded by Prœger; in all death was rapid, but we cannot stop to chronicle these, as the effects were the same as in the instances above cited.

It is worthy of note that some of the poisonous fishes are as hurtful to inferior animals as to man. Several illustrations of this fact have been collected. Dr. Collas, chief of the marine department of health at Pondicherry, had occasion to inquire into the poisonous nature of the goby, as he had been informed by the director of police there that several accidents had occurred in a native Mussulman's family of three persons, who had partaken of a dish made of some small fishes called in Talmic *Calou-oulouve*. The head of the family also told Dr. Collas that three fowls had died soon after eating some of the same dish. A native doctor or "*mestris*" repeated this experiment of feeding fowls on the fish, and with the same result.

At eight o'clock in the morning, Dr. Collas gave to one chicken three heads, and to another four heads of these fishes; at half-past nine the symptoms began, at eleven o'clock they increased, between one and two the poisoned animals died, without convulsions, in a state of extreme prostration. In a second experiment, the bodies of these same fishes were used which the heads had been taken off. The animals suffered from the same symptoms, but less severely, and were quite well the next morning.

The livers of ten gobies were administered to one chicken, and killed it in two hours. The intestines of ten of these fishes, separated from the livers, produced the same results. The entire fishes, deprived of their livers and intestines, caused death in four hours and a half, in other experiments.—*Social Science Review*, July 19th, 1892.

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51. *Antidotes for Strychnia.*—Professor RANIERI BELLINI, after conducting a long series of experiments on poisoning by strychnia and its salts, arrives at the opinion, that the best antidotes are tannic acid and tannin, chlorine, and the tinctures of iodine and bromine. Chlorine, he maintains, attacks the strychnia even when it is diffused through the system; for he found that in rabbits poisoned with the sulphate of the alkaloid, on being made to inhale chlorine gas in quantity such as was not sufficient in itself to kill, the convulsions were retarded, and were milder when they occurred; death also was less rapid. The author further observed, that when strychnia was exhibited with pyrogallic acid, the convulsion was retarded for the space of half an hour, in comparison with other experiments in which the alkaloid was given by itself. Professor Bellini believes that this arrest in symptoms is not dependent on the acid acting chemically on the strychnia, but only through the astringent effects produced by the acid on the mucous membrane of the stomach, whereby the absorption of the poison is rendered difficult. The same author, dwelling on the frog-test for strychnia, asserts that this test is not to be trusted, inasmuch as other poisons produce the tetanic symptoms, although in a lesser degree. He adds, in speaking of the effects of the antidotes to which reference has been made, that he trusts his results will have a bearing not only on the treatment of strychnine tenanus, but on traumatic and idiopathic tetanic disease.—*London Medical Review*, June, 1863, from *Annali di Chimica*.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Radical Cure following an Operation for the Relief of Strangulated direct Inguinal Hernia. By SAMUEL J. JONES, M. D., Assistant Surgeon U. S. N.—C. D., a sailor attached to a gunboat on the blockade, on the 12th of March, attempted to raise a navy gun-carriage supporting a 100-pounder Parrott gun. On the following day, March 13, he complained to the medical officer of the vessel, Act.-Assist. Surgeon Henry, of having pain in his "stomach." An anodyne was given him, and no further complaint was made by him until about 1 o'clock A. M. on the morning of the 14th, when he complained of pain in his groin, and some swelling. Examination revealed inguinal hernia of the right side. An effort to reduce it by taxis was made, which proved unavailing. An enema of infusion of tobacco was given, and the effort to reduce by taxis was repeated, but without success. At 7 A. M., a nauseant was given him, and during the relaxation from that, another trial was made to reduce it by taxis, which also failed. At 11 A. M., on the same day, I was asked to see the patient, and to operate to relieve the strangulation. After learning the history of the case, we concluded to etherize the patient thoroughly, and apply ice to the base of the tumour, and make one more effort by taxis before operating. This, too, failed to produce the desired result, and at 3 o'clock P. M.—about 48 hours after the hernia was produced—whilst the patient was again under the influence of ether, I cut down upon the tumour, under the impression that it was indirect inguinal hernia, which had become strangulated at the external abdominal ring. As soon as I opened the sac, I found that there was no constriction at the external ring, nor was there any portion of the intestine in the inguinal canal. A portion of the intestine, about the size of a small hen's egg, rested on the spermatic cord, outside of the external ring. It was almost black, and was immovable at the point of constriction, which proved to be in the conjoined tendon, on the inner side of the internal column of the external ring. With difficulty I succeeded in getting a blunt-pointed bistoury upon the point of constriction, which was small, and not unlike the stem of a mushroom, beneath the larger crown. By careful and constant pressure I succeeded in getting the bistoury introduced through the stricture. Then, by slightly rotating the bistoury, I enlarged the artificial opening in the conjoined tendon, and drew out the bowel a little distance, and soon had the gratification of seeing the blackened hue of the bowel replaced by more of a mahogany colour, showing that the circulation was being re-established in the part. After waiting a few moments for this purpose, I again introduced the knife, and enlarged the opening sufficiently to enable me to return the bowel to the cavity of the abdomen, which I did by carefully kneading it. As soon as the bowel was replaced, the incision was closed by a few sutures and adhesive strips, and covered with a compress and roller. At 10 P. M., the patient took an anodyne, and rested well during the night. On the morning of the 15th

his pulse was 80, and full and strong. A saline aperient was given him, and arrowroot diet. Later in the day, there was slight arterial excitement, and his bowels had not been relieved. His pulse was controlled by small repeated doses of tartar emetic, and enemata of warm water were administered, followed by fecal discharge.

On the 16th he was doing well, and was transferred to the U. S. Naval Hospital at Portsmouth, Va.

Subsequently, I learned from Surgeon Wales, U. S. Navy, who attended him whilst there, that, after several days in the hospital, decided peritonitis followed, which yielded to opiates and general antiphlogistic treatment.

His recovery was delayed by repeated imprudence in his diet during his convalescence, but he eventually recovered, and it seems the cure is radical.

Fracture of the Thigh by a Minie Ball. BY ARMISTEAD PETER, M.D., Ass. Surg. U. S. A., Seminary Hospital, Georgetown, D. C. (Extract from a letter to the editor, dated June 11, 1863.)

My attention has been called to an article in your journal of April, 1863, by Dr. Carothers, on fracture of femur, and in justice to myself and associates I must take upon myself to correct Dr. C.'s views concerning the case which he saw at the Seminary Hospital.

Lieut. Joseph Tall, 86th N. Y. volunteers, was wounded in the seven days' fight, Pope's campaign. Having laid in an old barn for *ten days*, he was brought to our hospital September 9th, and placed in my ward. Upon examination I discovered a fracture of the right femur, about two inches *below the trochanters*, and not extending *into* the trochanters (also another wound immediately below the left clavicle, the ball making its exit above the left scapula; this wound healed kindly, and gave but little inconvenience). The fractured femur was immediately placed in one of Professor Smith's anterior splints, and the leg suspended. Although a man of indomitable pluck, he was very weak when I first saw him. My patient for two weeks did remarkably well, when he complained of pain at the fracture. I assisted Surg. B. A. Clements, U. S. A., when he readjusted the splint, which had become slightly displaced; pain was relieved, and the patient did well for several days, when symptoms of pyemia set in. Under judicious treatment the pyemia subsided, and he was once more cheerful, *when unfortunately the adhesive strips which supported the splint and leg became displaced, very little, it is true, but still enough to move the upper suspending* cord *above* the point of fracture. *This caused* the upper fragment to become depressed, whilst the lower one was raised in proportion; the consequence was that apposition was wanted, and the rough serrated edges of the two bones being brought in contact with the muscles, intense irritation ensued. Sunday, 28th September, I discovered the cause of complaint, and reported the circumstances to the surgeon in charge, F. Hinkle, late of the U. S. N. We immediately concluded to etherize the patient and make a thorough examination, which we did, and found but one piece of bone separated from the shaft, and that was *perfectly square*, about *an inch* (*not more*) in diameter. This was removed. We found the fracture to be oblique, and the edges roughly serrated. The leg was very painful at this time. Dr. H. and myself expressed our opinion freely about amputating and exsecting, but concluded to wait until the next day, Monday, September 29th, when Surgeon Clements (who had charge of all the hospitals here) would see the case again. Lieut. Tall was perfectly satisfied to have his leg amputated, and so expressed himself. Dr. Clements exa-

mined the case, and, upon consultation, we three determined to run the risk of reapplying the wire splint. A. A. Surgeon Warner, from Baltimore, Md., who had seen Dr. Smith apply his invention, was called up from the second ward, and he and myself refixed the leg. Together we watched it carefully, and from that day up to the 22d of December, 1862, when he left for home, he continued to improve. His leg is about two inches short, but he manages to walk very well with the aid of a cane. Dr. W. deserves the credit of the cure, for his untiring devotion to the Lieutenant I really think was the means of saving the limb.

DOMESTIC SUMMARY.

Bromine in Hospital Gangrene, Erysipelas, &c.—Dr. J. H. Brinton, Surg. U. S. V., appointed by the Surgeon General to investigate the character of the Hospital Gangrene, Pyæmia, and Erysipelas prevailing in the U. S. Hospital at Louisville, and the different modes of treatment there employed for those affections, has made the following interesting report:—

On my arrival in Louisville, I called on Surgeon M. Goldsmith, U. S. V., the Medical Director of the Louisville Hospitals. In company with him I visited the principal military hospitals in the city and vicinity, and carefully examined the various cases of hospital gangrene and erysipelas therein contained. The type of the former affection at the period of my visit was somewhat similar to that which I had previously observed in the U. S. A. General Hospitals at Annapolis, but, although of analogous form, the disease did not appear to me to be of so virulent a grade; whether this was due to the original character of the affection or to the effect of the remedial measures employed, I am not prepared properly to decide. Nearly all the cases observed by me were in the stage of reparation, and but very few in the period of progress. The shape of the ulcers was characteristic, as was also the appearance of the gray slough, but the tendency of the sores to burrow deeply, and to extend rapidly, was not well marked at the time I examined the cases, some thirty in number.

The treatment almost universally adopted in the Louisville hospitals is that originated and introduced by Surgeon Goldsmith, U. S. V. It consists in the direct local application of bromine, either pure or in solution, to the surfaces of the sloughing sore. Due care is always taken first to remove as thoroughly as possible the sloughs, so that the agent may act on the living tissues, and permeate them to some extent. In cases in which the burrowing is so extensive and deep-seated as to render the application of bromine difficult or incomplete, Dr. Goldsmith resorts to hypodermic injections of bromine at the circumference of the sore. The punctures with the point of the syringe are made at intervals of from one-half to three-fourths of an inch, and one drop of pure bromine is thrown into the tissues at each application. The mode of dressing the surface of the sores with the bromine was exhibited to me by Dr. Goldsmith. From my observation of the immediate effect of the reagent upon the diseased tissues, and of the condition of the sores upon which it had been previously applied, I am inclined to look upon the remedy as one of great value, and well deserving of a fair and extended trial.

Surgeon Goldsmith declared to me that in forty-eight hours the specific character of any sore, the result of hospital gangrene, can be destroyed by a thorough use of the bromine. The arrest of the virulent process is at once evinced by the absence of the peculiar odour, and by the marked change for the better which immediately ensues in the constitutional symptoms.

From conversation with Surgeon Goldsmith I inferred that he regarded hospital gangrene as essentially a local affection, and that as soon as a decided local impression is produced upon the sore all danger to life is averted.

The whole number of cases of hospital gangrene treated in the Louisville hos-

pitals up to this time amounts to eighty-eight. But two deaths have occurred, and in these instances the disease was complicated with a very extensive inflammation of the cellular tissue.

I would remark that in the Louisville hospitals but little tendency has been observed in the disease to spread from bed to bed, although isolation of the gangrenous patients has not been enforced. In my own judgment the absence of this tendency to infection tells strongly against the supposed virulence of the affection, and should even throw doubts on its true nature, at all events in some instances. Assuming the disease, however, to be the veritable hospital gangrene, the facts connected with its origin were peculiar. The disease occurred almost always in patients who had been wounded at the battle of Murfreesboro', and who had been retained in crowded hospitals for some time previous to their transportation to Louisville. I am informed by Surgeon Thurston, U. S. V., Medical Director of the Nashville hospitals, that no one upon whom the gangrene had already appeared was ever sent from Nashville, and yet many were so infected when admitted to the Louisville hospitals. The development of this disease on the route seems to have been owing to the fact that the transportation of the wounded was effected by means of crowded and ill-ventilated boats, and that the trip by the Cumberland and Ohio Rivers frequently occupied several days. During this time these patients, who had already undergone much suffering, were exposed to all the influences most apt to engender this disease. In contrast with this fact it was found that, as soon as the Louisville and Nashville Railroad was opened, so that the wounded could be conveyed from city to city in one day, all importation of gangrenous sores into Louisville ceased. The development of hospital gangrene during the boat transportation is a noticeable fact, and is strikingly analogous with the same phenomena observed among our paroled wounded prisoners from Richmond, received into the Annapolis General Hospital some months since.

Erysipelas.—Two hospitals are especially set apart for this disease in Louisville (Nos. 19 and 20), both at some distance from the city, and originally country residences. These buildings are located on rising grounds, are well ventilated, and are tolerably well suited for their present purposes. All cases of erysipelas occurring in the city are at once sent thither, and strict isolation is enforced.

The whole number of cases of erysipelas treated at Louisville was two hundred and twenty-eight; of these ninety-seven were treated in Hospital No. 19, one hundred in Hospital No. 20, and thirty-one cases in Hospitals Nos. 4, 8, and 10. Out of the whole number fifty-one died, and one hundred and seventy-seven recovered.

Treatment.—In the application of bromine to the treatment of erysipelas, two different methods were employed: first, by the action of the vapour of bromine in the affected part; second, by a direct application to the erysipelatous surfaces of a solution of bromine of varying strength. In the first method the part affected was enveloped in a dry lint, a cloth saturated with pure bromine was then applied over this, and the whole dressing covered with a piece of oiled silk. The only objection to this treatment was the tendency of the bromine to blister the skin by soaking through the intervening layer of the lint. The other mode of using the bromine is to apply directly to the inflamed integuments a solution of the bromine and bromide of potassium, of the strength of from fifteen to forty drops of the former to an ounce of water. An ample opportunity was afforded me to observe the results of this treatment in the disease in question, and I have no hesitation in pronouncing it one which, so far as I have seen, is of the greatest value.

Having finished my observations of erysipelas and hospital gangrene in Louisville, I proceeded to Nashville, and placed myself in communication with Surgeon Thurston, U. S. V., Medical Director of hospitals in that city. With him I visited all of the principal hospitals, and among others the one appropriated to the reception of cases of erysipelas and hospital gangrene. I learned that the reports as to these diseases in Nashville had been much exaggerated. The whole number of cases of gangrene which had occurred since the battle of

Murfreesboro' has not exceeded twenty, and of these but six remained, all in progress of recovery.

The treatment followed in the Nashville hospitals consisted of applications of bromine, and the use of nitric acid in the ordinary manner. Dr. Thurston informed me that the latter treatment was preferred, and had, he thought, yielded the most successful results. It did not seem to me, however, that the bromine treatment, as practised in Nashville, was as thorough and effective as that pursued under the immediate supervision of Dr. Goldsmith.

Erysipelas in Nashville.—The number of cases of erysipelas following the battle of Murfreesboro' averaged about sixty until recently. At the time of visit that number had fallen to twenty, and all were tending towards recovery. All cases of disease were isolated on their first appearance in a hospital set apart for the purpose, under the charge of Assist. Surgeon Brown, U. S. A. This building was clean, well ventilated, and well managed. At the first outbreak of the affection several deaths had occurred in patients severely wounded.

I was informed by the Medical Director that at present the disease was tractable, and yielded readily to the therapeutic measures.

The treatment found most efficient, and which was almost universally adopted, was the local use of the bromine as already described; for constitutional remedies dependence was placed on iron, bark, tonics, full diet, &c.

Leaving Nashville, I proceeded to Murfreesboro'. The hospital gangrene, which at one time had been there rife and destructive, had almost disappeared; but few cases remained, and were convalescent.

The bromine treatment had been freely employed, but with varying results. I observed that its strongest advocates were those medical officers who had been previously stationed in Louisville, and who had been instructed in its use by Surgeon Goldsmith.

In conclusion, from a careful investigation of the cases in hospital at the time of my visit to the cities above mentioned, I would remark:—

1st. That the external employment of bromine in the treatment of hospital gangrene has been attended in Louisville with the most marked and beneficent results.

2d. That I have not observed that any injurious consequences whatever have resulted from its application, but the contrary.

3d. That all the medical officers with whom I have conversed in Louisville, Nashville, and Murfreesboro', unite in testimony as to the valuable therapeutic powers of bromine in the treatment of erysipelas; my own observation fully confirms their views.

4th. That as a disinfectant the use of bromine in hospital wards, and especially in hospitals intended for the reception of infectious disease, it is to be recommended, and is eminently deserving of further trial.

It will be observed that in the above report I have not alluded to the subject of pyæmia. In explanation I will state that I did not meet the disease in any of the hospitals I visited. I was informed that the pyæmic affection had not existed to any great extent; at all events, to an extent unduly proportioned to the number and gravity of the wounds following the Murfreesboro' battle. Full reports, however, of the affection, as it did prevail, are in process of preparation, and will be submitted to you when received.

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Embolus of the Pulmonary Artery. By S. Oakley Vanderpoel, M. D., of Albany, New York.—The study of *emboli* having of late years attracted the attention of pathologists, I have deemed the following notes of a case which has just passed under my observation, as illustrating still further the subject, would not be without interest. In the *American Journal of Medical Sciences* for April of this year, a case is reported, which, though originating from a traumatic cause, is ascribed to a condition of the system prominent in the one under consideration, viz., a lowered force of the heart, and perhaps contractility of the vessels.

I was called to attend Mrs. O—— on the 9th of April. She was about sixty years of age, and, while not corpulent, adipose tissue was full and well distributed. There were no constitutional symptoms or marked general disturbance,

but she complained of slight neuralgic pains alternating in different parts of the body; also, on attempting to rise, a sensation of great languor, and a feeling of lightness in the head. I noticed, while there was marked fairness and whiteness of the skin, there was no anæmia. I supposed it a case where nutrition was perverted; and though not decided fatty degeneration, still the molecular changes approximated that condition. Absolute rest was enjoined. She was directed to be raised only when necessary, and with care. A sustaining treatment, combined as necessary with morphine, was adopted. Improvement was gradual but marked. At my morning visit some three weeks since she complained of an unpleasant feeling in the left arm, as also that for an hour past it had been *cold;* she was obliged to keep it covered, and near a bottle of hot water.

On examination I found, while sensation was perfect, and motion no way impaired, save a feebleness in the limb, the circulation had so far ceased that no pulsation was perceptible in any part. This feeble vitality remained for over two hours, when the obstruction gave way suddenly, and circulation in all respects was as in the opposite limb. During the period of the obstruction I listened several times to determine whether any growths near the valves would, by floating off, cause the condition. Nothing abnormal could be detected.

Her general health improved so far that she rose easily from the bed, walked to the adjoining room, and sat up for some time. It was after a comfortable night, and, as she expressed it, "a more natural feeling than she had yet had," that she was seized with dyspnœa and prostration while walking into the adjacent room. I saw her very soon after: she was breathing very labouredly and rapidly; a dusky pallor was upon the surface; the heart was acting tumultuously, yet the capillary circulation was imperfect, and the extremities cold. Dr. Hun visited her in consultation during the afternoon, and suggested that the embolus was probably in the pulmonary artery. She lived about nineteen hours from the time of seizure.

Post-mortem, twelve hours after death.—The contents of the thoracic cavity (which was the only part examined) were removed entire. Upon opening the right ventricle of the heart a round, firm, fibrous band, about four lines in diameter, and some three inches in length, was found extending from the fleshy columns of the ventricle to the semilunar valves, and terminated in a bulb of black, coagulated blood, just within the pulmonary artery. Upon carefully dividing the branch of the pulmonary artery leading to the left lung, a fibrous deposit of quite firm consistence, about one inch in length, and of the diameter of the artery, was found just at the first branching of the artery within the lung, completely plugging the artery, and sending prolongations into the branches of the second size. The same condition was found upon dividing up the trunk leading to the right lung, save that the deposit on the left arterial trunk was *firmer* than the right.

The left ventricle contained a small amount of black coagulated blood; the right was *empty*. The muscular tissue of the heart was easily torn, and its outer surface covered with rather more than the usual layer of fat. The arteries showed no atheromatous deposit; the lungs were healthy, and, though not exsanguined, contained a less amount of blood than is usually found in the capillaries of the lung after death.

The microscopic appearance of the plug showed fibrillated fibrin, dense in structure, the meshes filled with hæmatine; some portions were evidently of more recent formation than others.—*American Med. Times*, June 20, 1863.

UNIVERSITY OF PENNSYLVANIA.

At a Public Commencement, held March 14, 1863, in the Musical Fund Hall, the degree of Doctor of Medicine was conferred by Rev. Daniel R. Goodwin, D. D., Provost, upon the following gentlemen; after which an Address was delivered by Wm. Pepper, M. D., Professor of the Theory and Practice of Medicine and Clinical Medicine.

NAME.	TOWN OR P. O.	COUNTY.	STATE.	SUBJECT OF THESIS.
Atkinson, James T.	Amherst,	Cumberland,	Nova Sco.	Scarlet Fever.
Beers, A. M.	New Comerstown,	Tuscarawas,	Ohio,	Umbilical Hernia.
Bell, W. T.	Santa Fe,	Santa Fe,	New Mexico,	Yellow Fever.
Brinton, Wm. B.	West Chester,	Chester,	Pa.	Arterial Sedatives.
Byers, George	Selin's Grove,	Snyder,	Pa.	Pneumonia.
Carothers, A. E.	Newburg,	Cumberland,	Pa.	Compound Comminuted Fracture of the Femur.
Cheston, Elijah	Bristol,	Bucks,	Pa.	The Reliability of Pharmaceutical Preparations.
Cleaver, Israel	Reading,	Berks,	Pa.	Diarrhœa.
Corson, Ellwood M.	Plymouth Meeting,	Montgomery,	Pa.	Enteric Fever.
Corson, Joseph K.	Plymouth Meeting,	Montgomery,	Pa.	Extract of Indian Hemp.
Cottrell, Joseph F.	Columbia,	Lancaster,	Pa.	Diabetes.
Dale, Jared Y.	Boalsburg,	Centre,	Pa.	Pyæmia.
De Groff, Ephraim	Philadelphia,		Pa.	Phthisis Pulmonalis.
Dickson, Jno. M.	Philadelphia,		Pa.	Scarlatina.
Drake, Whitfield H.	Bethlehem,	Hunterdon,	N. J.	Opium.
Drennan, M. C.	Easton,	Northampton,	Pa.	Uterine Hemorrhage.
Eakin, A. Louis	Philadelphia,		Pa.	Inflammation.
Engler, George S.	Easton,	Northampton,	Pa.	Cholera Morbus.
Enoch, Hiram D.	Washington,	Washington,	Pa.	Enteric Fever.
Everhart, I. F.	Blue Rock,	Chester,	Pa.	The Tripod of Life.
Fitch, C. Peckham	Philadelphia,		Pa.	The Teeth; their Anatomical, Physiological, and Pathological Relations.
Fretz, A. N.	Boyerstown,	Berks,	Pa.	Tetanus.
Gittings, J. B. Howard	Upper Falls,	Baltimore,	Md.	Veratrum Viride.
Gray, Samuel G.	Columbia,	Lancaster,	Pa.	The Preparations of Mercury.
Grier, Matthew J.	Philadelphia,		Pa.	Rheumatism.
Hagy, J. A.	Philadelphia,		Pa.	Treatment of Fractures of the Femur.
Hamell, Benjamin F.	Camden,	Camden,	N. J.	Sequelæ of the Chickahominy Fever.
Hawks, J. Albert	Lambertsville,	Hunterdon,	N. J.	Enteric Fever.
Heritage, J. D.	Hurffville,	Camden,	N. J.	Chickahominy Diarrhœa.
Humphrey, Chas. E.	Cherryville,	Northampton,	Pa.	Circulation.

NAME.	TOWN OR P. O.	COUNTY.	STATE.	SUBJECT OF THESIS.
Inskeep, Edward W.	Media,	Delaware,	Pa.	Scarlatina.
James, H. H.	Budd's Lake,	Morris,	N. J.	Typhoid Fever.
Jones, Wm. H.	Easton,	Northampton,	Pa.	Dysentery.
Jordan, Alex. S.	Coopersburg,	Lehigh,	Pa.	Scarlatina.
Keffer, Fred. A.	Philadelphia,		Pa.	Gunshot Wounds.
King, W. Howard	Philadelphia,		Pa.	Variola.
Kreider, C. L.	Lebanon,	Lebanon,	Pa.	Constipation.
Le Moyne, Frank	Washington,	Washington,	Pa.	Gunshot Wounds.
Lees, John S.	Andora,	Philadelphia,	Pa.	Colica Pictonum.
Light, Samuel B.	Lebanon,	Lebanon,	Pa.	Pain.
Ludlow, R. G.	Nesharie,	Somerset,	N. J.	Acute Gastritis.
Martin, Wallace D.	Middletown,	Dauphin,	Pa.	Enteric Fever.
McAdam, A. H.	Philadelphia,		Pa.	Phthisis.
McNeilly, Robert	Columbus,	Franklin,	Ohio,	The Relation of Mind to Disease.
Melly, S. S.	Lebanon,	Lebanon,	Pa.	Scarlatina.
Metcalf, Joseph N.	Garrettsburg,	Christian,	Ky.	Sleep and Death.
Middleton, H. P.	Washington,		D. C.	Vesico-Vaginal Fistula.
Miller, Jacob F.	Easton,	Northampton,	Pa.	Leucorrhœa.
Milligan, H. W.	Philadelphia,		Pa.	Causes of Deafness.
Myers, James S.	Philadelphia,		Pa.	Gunshot Wounds of the Knee-Joint.
Norris, John C.	Washington,		D. C.	Syphilis.
Peterson, Robert E.	Crosswick,	Burlington,	N. J.	Dysentery.
Pleibel, Fred.	Richmond,	Philadelphia,	Pa.	Arthritis.
Plunket, James D.	Nashville,	Davidson,	Tenn.	Acute Pneumonia.
Pomeroy, Geo. B.	Cincinnati,	Hamilton,	Ohio,	Cynanche Tonsillaris.
Pratt, Lynden M.	Groton Centre,	Middlesex,	Mass.	Gunshot Wounds.
Reber, Mayberry S.	Mohrsville,	Berks,	Pa.	Physical Diagnosis of the Respiratory Organs.
Reed, Samuel P.	Scranton,	Luzerne,	Pa.	Functional Diseases of the Liver.
Reeve, J.	Medford,	Burlington,	N. J.	Typhoid Pneumonia.
Rhoads, Edward	Philadelphia,		Pa.	Therapeutics not Empiricism.
Richardson, Jno. P.	Norristown,	Montgomery,	Pa.	Enteric Fever.
Smith, S. D.	Newark,	New Castle,	Del.	Has the Type of Disease Changed?
Smith, George W.	Frankstown,	Blair,	Pa.	Eclampsia Gravidarum et Parturientium.
Stevenson, J. R.	Camden,	Camden,	N. J.	Typhoid Fever.
Storror, Edward	U. S. A.			Erysipelas.
Stretch, Charles C.	Alloways town,	Salem,	N. J.	Hernia.
Strickland, D. Hayes	Hayesville,	Chester,	Pa.	Morbus Coxarius.
Swartzlander, Frank	Yardleyville,	Bucks,	Pa.	Diphtheria.
Trull, Washington B.	Boston,	Suffolk,	Mass.	Bilious Remittent Fever.
Tuller, Charles, Jr.,	Philadelphia,		Pa.	Dyspepsia.
Tyson, James	Reading,	Berks,	Pa.	Gunshot Wounds.
Uhler, A. S.	Schuylkill Falls,	Philadelphia,	Pa.	Pneumonia.

NAME.	TOWN OR P. O.	COUNTY.	STATE.	SUBJECT OF THESIS.
Ward, G. M.	Philadelphia,		Pa.	Observations in Surgery during six weeks' residence in Convent, U. S. A. Hospital, Frederick City, Md.
Watson, R. Belville	Milton,	Northumberland,	Pa.	Signs of Pregnancy.
Webb, G. W.	Shepherdstown,	Jefferson,	Va.	Scarlatina; its Diagnosis and Treatment.
Welfley, D. P.	Salisbury,	Somerset,	Pa.	Diphtheria.
Wistar, Thomas	Philadelphia,		Pa.	Hydrophobia.
Young, Oliver C.	Colebrookdale,	Berks,	Pa.	On Diversities of the Right and Left Sides of the Human Body.

Total 78

UNIVERSITY OF PENNSYLVANIA—PHILADELPHIA.

MEDICAL DEPARTMENT.

NINETY-EIGHTH SESSION, 1863-64.

WILLIAM GIBSON, M. D., Emeritus Professor of Surgery.
GEORGE B. WOOD, M. D., Emeritus Professor of Theory and Practice of Medicine.
SAMUEL JACKSON, M. D., Emeritus Professor of Institutes of Medicine.
HUGH L. HODGE, M. D., Emeritus Professor of Obstetrics and the Diseases of Women and Children.
JOSEPH CARSON, M. D., Professor of Materia Medica and Pharmacy.
ROBERT E. ROGERS, M. D., Professor of Chemistry.
JOSEPH LEIDY, M. D., Professor of Anatomy.
HENRY H. SMITH, M. D., Professor of Surgery.
WILLIAM PEPPER, M. D., Professor of Theory and Practice of Medicine.
F. GURNEY SMITH, M. D., Professor of Institutes of Medicine.
R. A. F. PENROSE, M. D., Professor of Obstetrics and the Diseases of Women and Children.
JOHN H. PACKARD, M. D., Demonstrator of Anatomy.

The Lectures of the Session will begin on the second Monday of October and close on the first of March.

One Introductory will be delivered to the Course.

Clinical Instruction is given throughout the Session, in the Medical Hall, by the Professors, and at the Hospitals. At the Philadelphia Hospital, containing 571 beds, instruction is free.

Military Surgery and Hygiene will be fully taught by the appropriate chairs.

The Dissecting Rooms, under the superintendence of the Professor of Anatomy and the Demonstrator, are open from the middle of September.

The room for Operative Surgery and the Application of Bandages, &c., is open early in September and throughout the Session, under the supervision of the Professor of Surgery.

Surgical Demonstrators, ... C. S. BISHOP, M. D., H. LENOX HODGE, M. D.

Fees for the Lectures (each Professor $15) $105
Matriculation Fee (paid once only) 5
Graduation Fee 30

R. E. ROGERS, M. D., *Dean of the Medical Faculty, University Building.*

SAMUEL PRICE, *Janitor, University Building.*

P. S.—Board may be had at from $2 50 to $6 per week.

JEFFERSON MEDICAL COLLEGE—SESSION 1863–64.

The Session will commence on Monday, the 12th of October, with a General Introductory Lecture by one of the Professors. The regular lectures will begin the day after. The Session will terminate on the last day of February. Great attention will be paid to instruction in the departments of Medicine and Surgery which have more intimate relations to military and naval service.

ROBERT M. HUSTON, M. D., { Emeritus Professor of Materia Medica and General Therapeutics.

CHARLES D. MEIGS, M. D., { Emeritus Professor of Obstetrics and Diseases of Women and Children.

Institutes of Medicine, ...	By Prof. ROBLEY DUNGLISON, M. D.
General, Descriptive and Surgical Anatomy, .	" JOSEPH PANCOAST, M. D.
Chemistry, ...	" FRANKLIN BACHE, M. D.
Institutes and Practice of Surgery, . .	" SAMUEL D. GROSS, M. D.
Materia Medica and General Therapeutics, .	" THOMAS D. MITCHELL, M.D.
Practice of Medicine, ...	" S. HENRY DICKSON, M. D.
Obstetrics and Diseases of Women and Children,	" ELLERSLIE WALLACE, M.D.

Clinics will be held regularly in September; and every Wednesday and Saturday in October, and during the course, Medical and Surgical cases will be investigated, prescribed for, and lectured on before the Class. During the year ending March the first, 1863, a large number of medical and surgical cases were treated, and numerous surgical operations performed; among them many of the most important. The lectures are so arranged as to permit the student to attend the clinics of the Pennsylvania Hospital, and the Philadelphia Hospital.

On and after the 1st of October, the dissecting-rooms will be open, under the direction of the Professor of Anatomy and the Demonstrator.

FEES.

Matriculation, which is paid only once, ...	$ 5
To each Member of the Faculty $15, ...	105
Graduation, ...	30

ROBLEY DUNGLISON, M. D.,
Dean of the Faculty.

UNIVERSITY OF NEW YORK.

MEDICAL DEPARTMENT—SESSION 1863–4.

The Session for 1863–4 will begin on Monday, October 19, and will be continued until the 1st of March.

FACULTY OF MEDICINE.

Rev. ISAAC FERRIS, D. D., LL. D., *Chancellor of the University.*

VALENTINE MOTT, M. D., LL. D., Emeritus Professor of Surgery and Surgical Anatomy, and Ex-President of the Faculty.

MARTYN PAINE, M. D., LL. D., Professor of Materia Medica and Therapeutics.

GUNNING S. BEDFORD, M. D., Professor of Obstetrics, the Diseases of Women and Children, and Clinical Midwifery.

JOHN W. DRAPER, M. D., LL. D., Professor of Chemistry and Physiology, President of the Faculty.

ALFRED C. POST, M. D., Professor of the Principles and Operations of Surgery, with Military Surgery and Hygiene.

WILLIAM H. VAN BUREN, M. D., Professor of General and Descriptive Anatomy.

JOHN T. METCALFE, M. D., Professor of the Institutes and Practice of Medicine.

WM. R. DONAGHE, M. D., Demonstrator of Anatomy.

Besides daily Lectures on the foregoing subjects, there will be five Cliniques, weekly, on *Medicine*, *Surgery*, and *Obstetrics*.

The Dissecting-Room, which is refitted and abundantly lighted with gas, is open from 8 o'clock A. M., to 10 o'clock P. M.

Fees for a full Course of Lectures, $105; Matriculation fee, $5; Graduation fee, $30; Demonstrator's fee, $5.

*** The usual *Spring*, *Summer*, and *Autumn* Course will begin on Monday, March 23, and be continued till the Winter Session commences. This Course is free to those who attend the Winter Session. Others pay $30.

HARVARD UNIVERSITY.

MASSACHUSETTS MEDICAL COLLEGE.

The annual course of Medical Lectures of Harvard University will commence at the Massachusetts Medical College, in North Grove Street, Boston, on the first Wednesday of November, 1863. The regular course will be as follows:—

Obstetrics and Med. Jurisprudence,	by Professor	D. Humphreys Storer, M. D.
Morbid Anatomy,	"	John B. S. Jackson, M. D.
Clinical Medicine,	"	Henry I. Bowditch, M. D.
Anatomy and Physiology,	"	Oliver W. Holmes, M. D.
Theory and Practice of Medicine,	"	George C. Shattuck, M. D.
Surgery,	"	Henry J. Bigelow, M. D.
Chemistry,	"	John Bacon, M. D.
Materia Medica	"	Edward H. Clarke, M. D.

Demonstrator, David W. Cheever, M. D.

Clinical, Medical, and Surgical Instruction will be given at the Massachusetts General Hospital, with Surgical Operations.

Collateral special medical instruction will also be given at the Hospital by Lectures and otherwise, by Drs. Bowditch, Abbot, and Ellis.

Abundant material is afforded for the study of Practical Anatomy. The Room devoted to this department is open day and evening, and lighted by gas.

Fees for the Lectures, $85; Matriculation fee, $3; Graduation fee, $20.

Good Board can be obtained at $2 50 to $5 00 per week. Boarding places provided on application to the Janitor at the College.

Students are requested, upon coming to Boston, to call upon the Dean.

D. HUMPHREYS STORER, *Dean of the Faculty.*

July, 1863. *No.* 132 *Tremont Street, Boston.*

[July and Oct.]

BELLEVUE HOSPITAL MEDICAL COLLEGE—CITY OF NEW YORK.

SESSION FOR 1863-64.

The Trustees and Faculty announce with much gratification the continued success of this Institution. The great advantages of combining thorough *didactic* and *clinical* teaching, by the union of a Medical College with Bellevue Hospital, have been practically exemplified during the two past years; and the Trustees and Faculty appeal with confidence to the medical students and practitioners who have attended the first and second sessions, in behalf of the successful practical working of the new plan of medical education inaugurated on an extensive scale by this College.

FACULTY.

ISAAC E. TAYLOR, M. D., *President.*
AUSTIN FLINT, Jr., M. D., *Secretary.*

James R. Wood, M. D., Professor of Operative Surgery and Surgical Pathology.
Frank H. Hamilton, M. D., Professor of Military Surgery, Fractures, and Dislocations.
Lewis A. Sayre, M. D., Professor of Orthopedic Surgery.
Alexander B. Mott, M. D., Professor of Surgical Anatomy.
Stephen Smith, M. D., Professor of the Principles of Surgery.
Isaac E. Taylor, M. D.,
George T. Elliot, M. D.,
B. Fordyce Barker, M. D., } Professors of Obstetrics and the Diseases of Women and Children.
Benjamin W. McCready, M. D., Professor of Materia Medica and Therapeutics.
Austin Flint, M. D., Professor of the Principles and Practice of Medicine.
Timothy Childs, M. D., Professor of Descriptive and Comparative Anatomy.

BELLEVUE HOSPITAL MEDICAL COLLEGE—Continued.

R. Ogden Doremus, M. D., Professor of Chemistry and Toxicology.
Henry D. Noyes, M. D., Demonstrator of Anatomy.

N. R. Moseley, M. D., Prosector to Chair of Surgical Anatomy.
Sylvester Teats, M. D., Prosector to Chair of Operative Surgery and Surgical Pathology.
A. W. Wilkinson, M. D., Assistant to Chair of Chemistry and Toxicology.
Arthur A. Shiverick, M. D., Assistant to Chair of the Principles and Practice of Medicine.

PRELIMINARY TERM.

The preliminary term will commence on Wednesday, September 16, 1863, and continue to the beginning of the regular term, viz., four weeks. In addition to daily instruction in the Bellevue or Blackwell's Island Hospital during this term, didactic lectures on important practical subjects will be given daily, exclusively by members of the Faculty. Students are earnestly invited and advised (if practicable) to attend during the preliminary term, which is designed to be not merely a nominal, but an actual extension of the period of instruction.

REGULAR TERM.

The regular term will commence on Wednesday October 14, 1863, and end early in March, 1864.

During the whole of the term the Student will have the opportunity of attending at least two clinical hospital lectures daily. The didactic lectures are arranged so as not to interfere, but alternate with attendance in the Hospital wards. Ample time is allowed for accompanying the visiting physicians, surgeons, and obstetricians in their daily rounds, attending clinical lectures, witnessing surgical and obstetrical operations, and following private courses, without compromising in any measure the regular didactic instruction. Clinical and Demonstrative teaching in all branches constituting the great feature of this College, the arrangements are such as to render the immense resources of the Hospitals available to the Student to the fullest extent.

All the lectures in this College are given either in the Hospitals or in the College building situated within the Bellevue Hospital grounds.

The Bellevue Hospital receives annually from *ten* to *twelve thousand patients*. The annual number of births in this Hospital is about *five hundred*. The Blackwell's Island Hospital contains usually about *one thousand* patients, including always several hundred cases of syphilis. In addition to the immense field of clinical instruction afforded by these Hospitals, and the various institutions under the management of the Commissioners of Public Charities and Correction, the Student may avail himself of other extensive resources for practical instruction contained in the great metropolis.

Practical Anatomy, amply provided for by law, may be prosecuted to any extent, and without expense

Twenty-two resident Physicians and Surgeons are annually appointed on the recommendation of the Medical Board of the Hospital, after an examination, and receive a salary adequate to their support.

Fees for all the tickets, preliminary and regular terms, $105. Tickets for any of the seven departments may be taken out separately. *Fees required in all cases.* Matriculation fee, $5. Graduation fee, $30. There are no fees for Hospital tickets, and no charges for anatomical material. Students who have attended two full courses in other *accredited* schools receive all the tickets for $50. Students after two full courses in this College, or who have attended one full course in this College, and one full course previously in some other accredited school, are required to matriculate only.* Graduates of other schools, after three years, are required to matriculate only. Prior to the expiration of three years they receive a general ticket for $50.

The requirements for graduation are the same as in other Medical Colleges of the State of New York.

Board and lodging can be obtained for from $3 50 to $5 per week. The *necessary* expenses of a course of lectures in this College need not exceed $200.

For circulars or further information, address or apply to the Secretary of the Faculty, Austin Flint, Jr., M. D., Gramercy Park House; or to the Janitor, Mr. Edwin A. Ware, at the entrance to Bellevue Hospital, 26th Street, between First Avenue and East River.

* Homœopathic and Eclectic Colleges, although legally incorporated, are not accredited.